School of Archaeology



ANCIENT INDIA

Bulletin of the Archaeological Survey of India

NUMBERS 10 & 11
1954 & 1955

CONTENTS

[illegible]D PUBLISHED BY THE DIRECTOR GENERAL OF ARCHAEOLOGY IN INDIA, NEW DELHI
[illegible]NTED BY THE JOB PRESS LTD., KANPUR

Price Rs. 9 or 14s. (post free in India)

SUBSCRIPTION RATES, POST FREE IN INDIA,
FOR FOUR NUMBERS
Rs. 17 or £1-8s.

Subscriptions and all communications to:—

THE DIRECTOR GENERAL OF ARCHAEOLOGY IN INDIA
GOVERNMENT OF INDIA
NEW DELHI

ANCIENT INDIA

Bulletin of the Archaeological Survey of India

NUMBERS 10 & 11
1954 & 1955

CONTENTS

EDITED AND PUBLISHED BY THE DIRECTOR GENERAL OF ARCHAEOLOGY IN INDIA, NEW DELHI

PRINTED BY THE JOB PRESS LTD., KANPUR

Price Rs. 9 or 14s. (post free in India)

ANCIENT INDIA

NUMBERS 10 & 11
1954 & 1955

NOTES

THE present number of *Ancient India* is largely devoted to the report on the excavation at Hastināpura and allied exploration carried out by the Department of Archaeology between the years 1950 and 1952. The excavation forms an [illegible]rtant stage in the progress of Indian archaeological research in recent years. [illegible]e had been many references in the past to the Dark Age intervening between the [illegible]d of the Harappā culture and the beginning of the historical age with the advent [illegible] the Mauryas in the third century B.C. Sporadic, and often misdirected, attempts to [illegible]idge the gulf had not also been altogether lacking. But the work at Hastināpura may [illegible] regarded as the first well-directed step towards the attainment of the objective.

In order to prepare the reader for a full comprehension of the significance of the [illegible]vation, the results thereof may be outlined here. An ancient site in District Meerut, [illegible] Pradesh, still bearing the name Hastināpura, a capital-city mentioned in the epic [illegible]bhārata, was found, by excavation, to contain a succession of cultural periods. The [illegible] was represented by an occupation with a crude ochre-coloured pottery in a 'rolled' [illegible]ition. The second was characterized by the prevalence of a distinctive ceramic [illegible]stry, called here the 'Painted Grey Ware'. This period ended with a flood in the [illegible]cent river, after which, following a break in the occupation, the site was inhabited [illegible]e more by a people, definitely iron-using, who brought with them the well-known [illegible]rthern Black Polished Ware. Later people, well within the historical period, followed [illegible] the site; the last occupation, which took place after a long break of several centuries, [illegible]ted to the period of the Delhi Sultanate.

It is the earliest two cultures, particularly the second one, that are important in [illegible] present context. The first of these left a flimsy occupation at the site, and beyond [illegible] guess that its pottery will possibly be found identical with that likely to be associa- [illegible] with the Copper Hoards of the Gangetic valley (though no copper was found at [illegible]tināpura at this level), nothing more can be said about it.

The second culture, viz. that represented by the Painted Grey Ware, requires a [illegible]ore detailed treatment. This Ware, initially recognized in the 1940-44 excavation at [illegible]hichchhatrā, situated in the same archaeological zone as Hastināpura, was found by [illegible]e present excavator at a large number of sites in Panjab and west Uttar Pradesh in [illegible]s explorations conducted immediately before and after the Hastināpura excavation. [illegible] was also found by other explorers at a large number of sites along the dried-up valleys [illegible] the river Sarasvatī in Bikaner in north Rājasthān, where relics of the Harappā [illegible]lture were also found at many sites. That the Ware preceded the Northern Black [illegible]lished Ware was obvious; at the same time, the stratigraphy that could be observed at

some sites even before excavation made it equally clear that the gulf between the tw could not have been much. Here, then, was an industry belonging to the crucial a following the disappearance of the Harappā culture and the advent of the historical perio A systematic investigation of the problem indicated by it was thus called for, and th excavation of Hastināpura was the result.

The co-occurence of the Harappan relics and of the Painted Grey Ware in th same region, viz. Bikaner and Panjab, raised further hopes about the possibility of findin a site containing both, so that their inter-relationship could be stratigraphically esta blished. As the report points out (below, p. 7), such a site was Rupar, 60 miles nort of Ambālā in Panjab. Excavation was accordingly started here early in 1953, as result of which it was established that there was no overlap, but a distinct break, betwee the Harappā and Painted Grey Ware levels. There is, therefore, many a weak spot i the bridge we are attempting to build over the hiatus, but readers will agree tha fi Hastināpura and then Rupar have provided some of the solid grounds on which th bridge will ultimately rest.

Unconnected that the Painted Grey Ware was with the relics of any previo culture known in India, it is reasonable to suppose that its authors did not spring out o the Indian soil. What their 'area of characterization' was can only be known b persistent researches outside the limits of India including west Pakistan. Before that i done, any conclusion about their identity or affiliation must necessarily be highl provisional. If any speculation can be allowed at this stage, it must be circumscribe by the limited data available, which may be summed up in a few words, viz. that th Painted Grey Ware, the only distinguishable factor in the culture of these people, wa widespread in the north-western part of present-day India in the first half of the fir millennium B.C., with a possible extension into the last part of the second. The limi thus imposed do not, however, preclude the formation of a tentative conclusion; on th other hand, they encourage the belief that the Ware represents the relics of the Arya speaking people, or a branch thereof. For the distribution of the pottery is virtuall co-terminous with the land Brahmāvarta and Brahmarshi-deśa, held holy in the Arya literature and watered by those sacred rivers the virtues of which the Aryans we eloquent about. The date of the pottery is no less significant, for, if the 'convention date' of the entry of the Aryans into India, viz. 1500 B.C., is accepted (and evidences abou their movements in the Near East do not contradict this date), they would well hav reached the Gangetic plain a few centuries later.

A word may be necessary to justify the preference of the culture represented b the Painted Grey Ware to other post-Harappā cultures as belonging to the Aryan particularly in view of the fact that the claims of one culture of the latter group, vi the Cemetery H culture of Harappā, have been previously upheld by a few eminen archaeologists. Our main contention is that none of these cultures, including th Cemetery H one, had a distribution over the wide stretch of land in which the Arya speaking folk are known to have spread and settled. All of them were confined to the respective limited areas and must, therefore, be regarded as isolated phases in India archaeology. Not so the Painted Grey Ware, which, apart from its wide distributio had a distinct influence on the later ceramic industries of northern India and probabl even merged into them, just as the Aryans became an integral part of the Indian soi

The following report often refers to the *Mahābhārata* and the place-names mentione in it and brings into prominence the fact that the Painted Grey Ware is found at the site associated with the story of that epic. Such references are easily understandable an even unavoidable, for was not Hastināpura the focus of the epic-tale? But a wor of caution is necessary, lest the impression is left on the unwary reader that the Hastināpur

excavation has yielded archaeological evidence about the truth of the story of the *Mahābhārata* and that here at last is the recognition by 'official archaeology' of the truth embodied in Indian traditional literature. Such a conclusion would be unwarranted. Beyond the facts that Hastināpura, the reputed capital of the Kauravas, was found to be occupied by a people whose distinctive ceramics were the Painted Grey Ware in a period which might roughly have synchronized with the date of the origin of the nucleus of the *Mahābhārata* story, that this occupation came to an end with a heavy flood and that this Ware is found at many early sites, some of which are connected, either in literature or by tradition, with the epic-heroes, the excavation has no bearing on the authenticity or otherwise of the epic tale. It is indeed tempting to utilize archaeological evidence for substantiating tradition, but the pitfalls in the way should be guarded against, and caution is necessary that fancy does not fly ahead of facts.

A reference has been made above to the evidence just now obtained from the Rupar excavation that the Harappans predeceased the advent of the Painted Grey Ware people. This may be true of Rupar, but other sites having a different tale to relate may not be lacking. While, therefore, it is admittedly premature to hold that the latter people were no other but the Aryans, it is doubly premature to say that the Aryans had nothing to do with the disappearance of the Harappans. Even if that be the future concensus, the possibility will remain that the descendants of the Harappans, after the end of their glorious days, lived somewhere in India, still holding to their culture, if in a modified form, to contribute its traits to the pattern of Indian culture, either directly or through the Aryans or some other agency. Otherwise, the existence of the Harappan elements in Indian culture will remain unexplained.

* * * * * *

From the foregoing it will be obvious that only a fringe of the problem has been touched. The gulf of the Dark Age has been narrowed down but not filled, and there are many other dark spots in Indian archaeology. It will not do to concentrate alone on the post-Harappan and pre-Mauryan archaeology of north-west India, for even for the same period the problems in other parts of India are different. To attack the regional problems of Indian archaeology operations have to be organized regionally. To this end the limited resources of the Department will be systematically directed.

A. Ghosh



Fig. 1

(Since the preparation of this map in 1953, the Painted Grey Ware has been discovered at Bairāt and other places. See

EXCAVATION AT HASTINĀPURA AND OTHER EXPLORATIONS IN THE UPPER GANGĀ AND SUTLEJ BASINS 1950-52: NEW LIGHT ON THE DARK AGE BETWEEN THE END OF THE HARAPPĀ CULTURE AND THE EARLY HISTORICAL PERIOD

By B. B. Lal

As the title of the article indicates, the following report embodies the results of the excavation at Hastināpura and the explorations in the region between the Sutlej and the Gangā conducted by the author when he was the Superintendent of the Excavations Branch of the Department. Among other useful information, it brings to limelight a new ceramic industry, named the Painted Grey Ware, which, the author feels, represents the relics of the early Indo-Aryans.

CONTENTS

1. INTRODUCTORY

A. The problem and the approach

THE once-flourishing cities of Harappā and Mohenjo-daro came to an end some time about the middle of the second millennium B.C. What happened thereafter and before the early historical times archaeology has had very little to say. Thus, save for the meagre evidence from Shāhī Tump and Chanhu-daro, practically nothing was known of the material culture of the Indian people during this Dark Age until the fourth-third centuries B.C., when the records associated with the invasion of Alexander the Great and the rock- and pillar-inscriptions of Emperor Aśoka throw light on the contemporary conditions—social, religious and political. How to bridge this vast gap of nearly twelve centuries has been one of the most baffling problems of Indian archaeology.

According to literary evidence, however, it appears that some time at the beginning of this gap the Vedic Aryans were in occupation of the fertile plains of southern Panjab and the now-dessicated northern Rājasthān and that, as time passed, they moved eastwards into the Gangā basin. If this is true, one may reasonably expect the remains of their settlements in these areas. With a view to locating such remains, the author started examining a few sites mentioned in the early Aryan literature.

As a first step in this direction, the author paid a visit in October 1949 to the ruins at Hastināpura (cf. fig. 1), located at a distance of about 60 miles north-east of Delhi,[1] and referred to in the *Mahābhārata* and the Purāṇas and also in Jaina and Buddhist texts as the capital of the Kaurava kings.[2] In the lower levels of the mound was found a fine grey ware with designs executed in black pigment (hereafter called the Painted Grey

[1] Details regarding the topography, etc. of the site are given below, pp. 8 ff.
[2] See below, pp. 147 ff.

Ware). This was found superimposed by another class of pottery known to archaeologists as the Northern Black Polished Ware and dated from about the sixth-fifth to the second century B.C.[1] On a study of the previous pottery-collections lodged in the Central Asian Antiquities Museum, it was noticed that the Painted Grey Ware also occurred at Ahichchhatrā,[2] another site mentioned in the *Mahābhārata*. Encouraged by the find of the same class of pottery in the lower levels of the two alleged *Mahābhārata* sites, the author published a paper on the subject early in 1950, hinting that in this pottery might lie the key to the mysteries of the Dark Age.[3] While the article was in proof-stage the author undertook a trial-excavation at Tilpat, 11 miles south of Delhi. According to local tradition, Tilpat also is associated with the *Mahābhārata* story, and it was indeed gratifying to find there the same ceramic sequence as was observed at Hastināpura.[4] This encouraged the author further, and he planned a systematic exploration of over thirty sites mentioned either in the *Mahābhārata* itself or alleged to have been associated with the story according to local tradition. The investigations more than fulfilled his expectations, since almost all the sites yielded the Painted Grey Ware from their lower levels.[5]

This, however, was only one aspect of the approach. The author was no less anxious to ascertain the chronological horizon of the Painted Grey Ware with reference to the Harappā Ware. For, thus alone could the gap be suitably bridged. During his excavations at Koṭlā Nihang in the Ambālā District of Panjab, Shri M. S. Vats had discovered the Harappā ware at the site. Its geographical position, viz. its comparative proximity to the Gangā basin, made the present author think that hereabouts could be found a site which might contain both the Harappā and Painted Grey Wares. A search was made, and during December 1950 he discovered the mound at Rupar, about 2 miles to the north-west of Koṭlā Nihang, which contained not only the Painted Grey Ware but also Harappan pottery, faience bangles and a brick typical of that culture.

These explorations did no doubt put forward a provisional sequence of the ceramic industries of the Dark Age, but to get a clearer picture it was necessary to carry out systematic excavations at some of the sites. The author, therefore, recommended to the Director General that the mounds at Rupar as well as Hastināpura be taken up for excavation. It was, however, decided that the latter be attended to first and the former afterwards. Accordingly, work was started at Hastināpura in November 1950 and continued till March 1951. During April the author had to leave India for studies abroad, but after his return towards the end of the year work was resumed at Hastināpura and finally closed in March 1952. The results of the two seasons' dig at Hastināpura and of the explorations at other allied sites are placed here before the readers with a candid confession that what has been achieved is but a fraction of what still remains to be achieved in order to understand the Dark Age fully. An outline has been drawn but details have yet to be filled in to produce a complete picture.

B. Acknowledgements

The author would be failing in his duty if he did not take this opportunity of thanking his friends and colleagues who have variously helped him in the task. Shri B. K. Thapar

[1] *Ancient India*, no. 1 (1946), pp. 55-56.

[2] This class of pottery had for the first time been reported on in *Ancient India*, no. 1 (1946), pp. 58-59. Here it was found in the pre-Northern Black Polished Ware levels in one of the plots.

[3] B. B. Lal, 'The Painted Grey Ware of the upper Gangetic basin: an approach to the problems of the Dark Age,' *Jour. Roy. Asiatic Soc. Bengal* (*Letters*), XVI (1950), pp. 89 ff.

[4] Cf. *The Statesman* (New Delhi edition), July 5, 6 and 9, 1950.

[5] Cf. below, pp. 138 ff.

was the author's chief assistant throughout the exploration of the Painted Grey Ware sites and during the two seasons' dig at Hastināpura. To the report itself he has contributed the section on pottery and the sub-sections on beads, metal objects, brick-measurements and miscellanea. Shri S. Mukerji shared the author's responsibilities in the administration of the camp during 1950-51 and also supervised the digs at HST 2 and HST 3 during that season. Shri K. K. Sinha, besides participating in field-supervision and assisting the author in other ways, has written the sub-sections on terracottas, bangles, rings, stone images and other stone objects. The photographs accompanying the report have been taken by Shri R. Chatterji. The maps and sections have been drawn by Shri S. P. Jain, Shri L. Dutt and Shri B. Saran, while the drawings of pottery and other small finds have been produced variously by Shri Ram Prakash Khare, Shri Amir Singh, Shri Gauri Shankar, Shri L. Dutt and Shri Lalit Kumar Jain. Shri S. Banerji provided first-aid to the metallic objects and other antiquities in the field. Dr. S. C. Roy, a Departmental Scholar, Shri L. M. Dhruva, deputed by the Saurashtra Government, along with Shri V. K. Mishra, Shri Y. G. Mathur, Shri K. M. Srivastava, Shri Amar Chand and Shri K. R. Chari, from different universities, assisted in the field-work. To those mentioned above and to others who helped in the task in one way or another but whose names cannot be referred to individually for want of space the author's most grateful thanks are due.

Dr. B. B. Lal, Archaeological Chemist in India, kindly examined the glass bangles of Period II. Shri T. R. Gairola, Assistant Archaeological Chemist, obliged the author by chemically treating the coins and other metal objects. Shri T. N. Ramachandran, Joint Director General of Archaeology, helped in the identification of certain images. The few inscriptions recovered from the dig had already been made out by the author; they were, however, also sent to Dr. B. Ch. Chhabra, Government Epigraphist, for his examination, and his readings generally tally with those of the author himself. The author also wishes to record his gratitude to Shri A. Ghosh, Director General of Archaeology in India, and Dr. Y. D. Sharma, the author's successor in the Excavations Branch, for providing him facilities in connexion with the preparation of the report after his transfer to the Eastern Circle, Calcutta. Thanks are also due to Shri S. C. Chandra, the author's colleague at Calcutta, for lending a helpful hand now and then.

Outside the Department, quite a few scholars have contributed towards this report. Dr. K. A. Chowdhury and Shri S. S. Ghosh of the Forest Research Institute, Dehra Dun, have very kindly reported on charcoal, charred grains and mud-plaster recovered from the excavation. Through the good offices of Dr. B. S. Guha, Director, Department of Anthropology, Shri Bhola Nath has written the note on animal-remains. The author was also anxious to find out if analysis of pollen-grains embedded in the ancient deposits at Hastināpura could throw any light on the flora and climatic conditions of the time. Accordingly, he got in touch with Professor Ove Arbo Hoeg, Director, Birbal Sahni Research Institute, Lucknow, whose preliminary note is also published herewith. The author is indeed beholden to all these scholars for their kind co-operation.

In the end, the author would like to thank his wife, Kusum Lal, who has helped him not only in the analysis of the material in the field but also in various ways during the preparation of the report.

2. HASTINĀPURA

A. THE SITE AND ITS ENVIRONMENTS (fig. 1; pls. I-V)

Hastināpura, 29°9′ North Latitude and 78°3′ East Longitude, is located in Mawānā Tehsil of Meerut District in Uttar Pradesh (formerly known as the United

To face page 8

PLATE I



Hastinapura: general view of a part of the mound with cutting HST 2 looking north-east; in the foreground is seen the pottery-yard



Hastināpura: general view of a part of the mound with cutting HST 1, looking east



Hastināpura: general view of a part of the mound with a medieval retaining-wall, looking north

PLATE IV

To face page 9



Hastināpura: view of a rain-gulley where initial operations were started (HST 1), looking south-west

Provinces). The District headquarters, bearing the same name, lies on the Delhi-Ambālā section of the Northern Railways and from there a regular bus-service operates right up to Hastināpura, a distance of about 22 miles. One intending to visit the place from Delhi by road may do so *via* Meerut and Mawānā, the journey being a little over 60 miles in a north-easterly direction.

As one approaches Hastināpura, a series of mounds, jutting out against the eastern horizon, strikes the eye. At places they rise to a height of nearly 60 ft. above the surrounding ground-level. From the summit of these mounds may be had a glimpse of the river Gangā, which flows at a distance of nearly 5 miles to the east. Within a mile in the same direction can be seen another streamlet, sluggish yet perennial, called the Buḍhī Gangā, the 'old Gangā',— a fact indicating that in olden times the main river itself was flowing much nearer the mounds. As has been the case with most of the ancient river-side settlements (e.g. Pāṭaliputra), Hastināpura also seems to have developed more along the bank, which runs north-south, than at right angles to it. This is suggested by the extent of the ancient ruins which cover over half-a-mile from north to south, but hardly a quarter mile from east to west. These dimensions, however, may not truly represent the overall area originally covered by the ancient settlement, since, as the excavation has revealed, the Gangā had once washed away a considerable portion of the mound, bringing to an end the second occupational Period at Hastināpura (below, p. 14).

It appears that in ancient times these mounds formed one continuous unit, and it is the monsoons that have since cut the gullies and given the site its present contours. However, as seen today (pl. V), there are two main blocks of mounds, the northern and southern, separated from each other by a rain-gully, which is fairly wide on the western side but narrows down towards the east. The northern mound is locally known as Ulṭā Kheṛā, i.e. a topsyturvy mound. It is further sub-divided into two, again by a rain-gully running east-west. The northern sub-division, which is also the larger of the two, has on its top a dilapidated medieval structure and a very recently built Jaina shrine (pl. II). The southern sub-division is bounded on the south by a 15-20 ft. high wall of *lakhori* bricks (pls. I and III). On the top of the mound are traceable the remains of a large residential building, which, on the basis of the bricks, may be ascribed to the late medieval times.

The southern block has a fairly vertical face on the eastern side, but it slopes down considerably towards the west. While the highest contour in the eastern part is 780 ft. above the mean sea-level, that in the western part is only 750—a difference of 30 ft. in their comparative heights. This slope is obviously due to extensive erosion on this side, which also accounts for the absence of regular occupational strata here. In the eastern part there exists a domed building, presumably contemporary with the medieval structures on the northern block. To this building have been added recently a couple of rooms, and the entire accommodation is occupied by Arya-samajists, who have also put up a brick-lined sacrificial altar (*vedikā*). On the ground-level near the south-eastern corner of this mound stands a temple dedicated to Pāṇḍaveśvara Śiva. The temple is not very ancient, but the name all the same reflects what haunts the local memory.

To the north of these mounds, across the Mawānā-Latīfpur road, are two Jaina temples, one belonging to the Digambara sect and another to the Śvetāmbara one. The former stands on a fairly high mound, and the author was able to collect ancient pottery from exposures on its north-western periphery. The temple itself is comparatively recent, having been built at the beginning of the eighteenth century. Unlike this, the Śvetāmbara temple is situated on a ground which is in level with the surrounding area.

About hundred yards to the west of the northern block there is another piece of elevated land on which the local Public Works Department has put up a few godowns. In the western part of this area and also further to the north and west (not shown on

pl. V) can be picked up ancient pottery. This tends to suggest that while the main settlement may have been on the two blocks of mounds, stray dwellings also existed in the vicinity.

Apart from the two Jaina temples referred to above, there are three other memorials called *nisis* which may be considered of quasi-archaeological interest. They lie within a couple of miles north of the temples and are associated with three Jaina Tīrthaṅkaras, namely, Śāntinātha, Kunthunātha and Aranātha, who are said to have achieved enlightenment here.

The low-lying area to the east of the mounds (cf. the inset in pl. V) is known as the Khādar. Until recently it used to be full of weeds and other wild growths, but now the Government of Uttar Pradesh have reclaimed the land for extensive cultivation and have allotted it to the displaced persons from West Panjab as well as to ex-servicemen. The colonization has resulted in the coming up of several villages in the Khādar areas and of a well-planned township at Hastināpura itself.

In the Khādar also there are some places of interest. On the bank of the Budhī Gaṅgā two localities are known respectively as Draupadī Ghāṭ and Karṇa Ghāṭ (i.e. bathing places associated with Draupadī and Karṇa). Though there are no structural or other remains at these places, and in fact one does not expect any, the names do show how the local people hold these Ghāṭs in reverence, cherishing the memory of the *Mahābhārata* personages. On the eastern side of the Gaṅgā lies a low mound called Rājpur Parsu. As the crow flies, the distance from Hastināpura to this place would be about 4 miles. The well-known copper hoard, comprising celts and harpoons, was recovered from here.[1] Further, as will be seen below (p. 11), the earliest pottery from Hastināpura is similar to the pottery which is likely to have been associated with the copper implements at Rājpur Parsu.

B. Stratigraphy of the site and cultural equipment of various Periods

The primary object in taking up the excavation at Hastināpura was to find out the stratigraphic position of the Painted Grey Ware with reference to other known ceramic industries of the early historical period. Accordingly, emphasis was laid on vertical digging rather than on area-excavation. Four trenches, HST 1 to HST 4, varying from 9 to 44 ft. in width and 36 to 590 ft. in length, were laid across the mound at different points. Two of them, viz. HST 1 and HST 2, revealed that there had been at Hastināpura as many as five occupational Periods (numbered I-V from bottom upwards) with a definite break in between all of them. In the other two trenches, HST 3 and HST 4, remains of the medieval times alone (Period V) were encountered. The absence of earlier strata from these two trenches suggests that this part of the mound had been denuded fairly long ago, at any rate before the beginning of Period V.

All the five Periods were characterized by their typical ceramic industries and other objects like metal tools, terracotta figurines, etc. (cf. fig. 2 and table 1). The most outstanding of these industries are described below, beginning with the earliest Period.

(i) *Period I*

It was represented by a deposit of brown clay which varied from 1 to 1½ ft. in thickness and at places was even entirely absent, having been cut away by pits of later

[1] Vincent A. Smith, 'The Copper Age and prehistoric bronze implements of India', *Indian Antiquary*, XXXIV (1905), pp. 229 ff.


HASTINĀPURA (ANCIEN
WELL
TO LATIPUR
BORING 1
G
A
BORING 2
WELL
ŚVETĀMBARA
JAIN TEMPLE
DIGAMBARA
JAIN TEMPLE
SITE HST 1
POND
WELL
P.W.D. GODOWNS
TO MAWANA
WELL
HEIGHTS IN FEET ABOVE SEA LEVEL

Periods. The soil was comparatively hard to dig and came out in clods which occasionally contained 'rolled' fragments of a ware which, in the absence of a more suitable name, has been christened the 'Ochre-coloured Ware'. Made of medium-grained clay, the ware was rather under-fired. It seems to have had a wash of ochre, the colour of which ranged from orange-red to deep-red. The wash had a tendency to rub off. In some instances a red slip had been applied instead. Since the sherds were very small, no definite forms of the pots, except outlines of the rims, could be obtained (fig. 5, below, p. 31). It is also difficult to say if they were all wheel-turned, since the striation-marks, if there were any, have disappeared in the course of rolling about, which the sherds seem to have undergone.

No structures or antiquities were encountered in Period I. This may, however, be due to the fact that only a very limited area could be excavated in these lowest levels.

Pottery of the same fabric has also been found at Rājpur Parsu and Bisauli (below, p. 146), but since no shapes are available at any of the sites, it is difficult to establish the similarity fully. Copper hoards, comprising celts, harpoons and 'anthropomorphic' figures, etc. have also been found at the above-mentioned two sites, and it seems probable that they were associated with the Ochre-coloured Ware. Hastināpura, however, has not produced any implements of this class so far.

The stray occurrence of the potsherds in Period I suggests that the settlement was rather sporadic. The site was deserted by the inhabitants of this Period well before the arrival of their successors, since there was no cultural overlap between the two.

(ii) *Period II*

The most distinctive industry of this Period was the Painted Grey Ware. It had ... a very fine fabric, though coarser examples were also met with occasionally. ... of the ware varied from ashy to dark grey, the greyness being apparently the ... of reducing conditions in the kiln. The baking, however, was perfect. The more ... types represented in the ware were bowls and dishes with straight or convex ... and round or sagger-base. They were mostly wheel-turned, though hand-made ... were not altogether wanting. The pots had painted designs, usually in black ... but sometimes in chocolate or reddish-brown instead. In one case, however, ... colours, reddish-brown and cream, were used simultaneously. The paint seems to have been applied to the pots when they were dry and ready for firing. The motifs included: simple band round the rim, both inside and outside; groups of vertical, ... criss-cross lines usually on the outside profile but sometimes also on the interior; ... ts or dashes or dots alternating with simple lines; chain of short spirals on the ... file; concentric circles or semicircles, sigmas and *svastikas* either on the outside ... the interior of the base (figs. 6-10; pls. XXV-XXX). Alongside this ware, ... ch smaller quantity, was also produced another class of pottery with a ... grey core but reddish-brown slip. The designs in this case were painted ... colour and they did not exhibit such a variety as in the case of the Painted ... to the painted wares of the Period, mention may be made of a black- ... gh not at all possessing the lustre of the Northern Black Polished ... ps its forerunner. Some of the sherds in the black-slipped ... rior instead of the usual black, which suggested that they ... sition. The association of such pottery with the Painted ... by A. Ghosh at the sites explored recently by him in ... during this Period, of which a small percentage had a

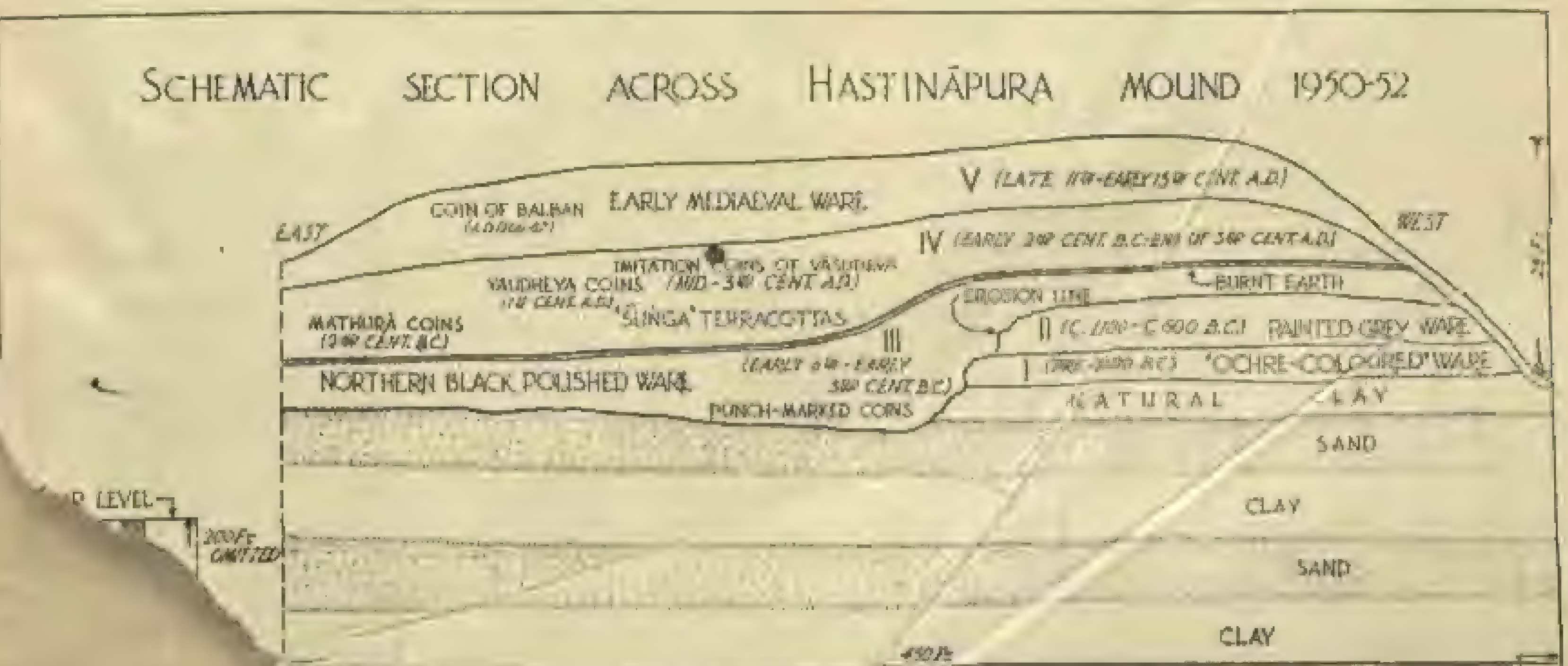

SCHEMATIC SECTION ACROSS HASTINĀPURA MOUND 1950-52
EAST
WEST
V (LATE 11th-EARLY 15th CENT. A.D.)
COIN OF BALBAN
EARLY MEDIAEVAL WARE
IV (EARLY 2nd CENT. B.C.-END OF 3rd CENT. A.D.)
IMITATION COINS OF VĀSUDEVA (MID-3rd CENT. A.D.)
YAUDHEYA COINS
'ŚUNGA' TERRACOTTAS
MATHURĀ COINS (2nd CENT. B.C.)
BURNT EARTH
EROSION LINE
III
(EARLY 6th - EARLY 3rd CENT. B.C.)
II (C. 1100 - C. 800 B.C.) PAINTED GREY WARE
I 'OCHRE-COLOURED' WARE
NORTHERN BLACK POLISHED WARE
PUNCH-MARKED COINS
NATURAL CLAY
SAND
CLAY
SAND
CLAY
200 Ft. OMITTED
LEVEL

FIG. 2

TABLE 1

HASTINĀPURA, 1950-52: SUMMARY OF THE RESULTS

Period	Date	Cultural equipment	Remarks
V	Early fifteenth century A.D. ↑ Late eleventh century A.D.	Pottery entirely different from that of the preceding Period. Red ware, coarse- to medium-grained. Glazed wares with a variety of floral designs. Structures made of brick-bats collected from remains of earlier periods. Four structural Sub-Periods. A variety of iron objects including nails, tanged arrow- and spear-heads, hoes, door-rings, knife-blades, awls, etc. Terracotta figurines showing poor workmanship; *satī-satā* plaques. Terracotta stamps and dabbers. Stone image one each of Pārvatī and Rishabhadeva. Bangles of glass, ivory, shell, bone, etc.; particular attention drawn by stratified glass bangles. Coin of Balban (A.D. 1266-87) from a middle level of the Period.	Glazed ware similar to that from 'Adilābād near Delhi.
		D E S E R T I O N	
IV	Late third century A.D. ↑ Early second century B.C.	Exclusively red-ware industry, wheel-turned, medium fabric; stamped designs. From the upper levels was also obtained black-on-red painted pottery. Houses invariably of *burnt* bricks (size 14½ × 9 × 2½ in.); squarish bricks (11 × 11 × 4 in.) used for floorings. Regular house-planning, orientation roughly along cardinal directions. Seven structural Sub-periods. Antimony rods, pins and a bell of copper; nails, axe-adze, sickle and pan of iron. Fine specimens of moulded terracotta figurines; 'Śuṅga' terracottas from lower levels; figure of Bodhisattva Maitreya executed after Mathurā school of sculptures from upper levels. Humped bull most favourite amongst the animal figurines. Terracotta wheels, toycart and votive tanks. Rotary quern of stone. Rings and beads showing high workmanship. Inscribed potsherds and a seal. Coins occurred throughout the Period. From bottom upwards they included coins of rulers of Mathurā (second century B.C.) and Yaudheyas (about the beginning of the Christian era) and imitation coins of the Kushan king Vāsudeva (about the middle of the third century A.D.)	Such material generally characterizes Śuṅga-Kushan levels of north Indian sites.
		LARGE-SCALE CONFLAGRATION, TRACES AVAILABLE THROUGHOUT THE SITE; BREAK IN OCCUPATION	
III	Early third century B.C. ↑ Early sixth century B.C.	Northern Black Polished (N.B.P.) Ware; coarse grey ware; unslipped red ware. Houses of mud-bricks as well as of kiln-burnt bricks (size 17½ × 10 × 2¼ in.). Six floor-levels in HST 2. Brick-lined drains; soakage-jars. Terracotta ring-wells. Arrow-head, chisel and sickle of iron; antimony rods, nail-parer, etc. of copper. Punch-marked and uninscribed cast coins. Terracotta animal figurines, elephant most favourite. Human figurines, some of them moulded. Terracotta flesh-rubber. Beads of etched carnelian and crystalline quartz, chalcedony and jadite. Bangles of copper and rings of copper.	Material culture comparable with that of the N.B.P. Ware levels at Kauśāmbī. The pre-N.B.P. deposits at Kauśāmbī may be placed between Periods II and III of Hastinā-
		HEAVY FLOOD IN THE GANGA : CONSIDERABLE PORTION OF SETTLEMENT WASHED AWAY: ABANDONMENT OF SITE	
II	C. 800 B.C. ↑ C. 1100 B.C.	Painted Grey Ware the main ceramic industry of the Period; also black-slipped ware; ordinary red and red-slipped ware. No regular house-plans obtained; walls of mud or mud-bricks; also reed-walls with mud-plaster. A fragmentary burnt brick also met with. Copper arrow-head, nail-parer, borer(?), antimony rod, etc. Iron slags in the uppermost levels. Weights of chert and jasper. Bangles of glass. Terracotta animal figurines, discs and a feeding cup. Styli or knitting needles of bone. Charred grains of rice. Bones of horse, pig, cattle, etc.	Painted Grey Ware also found at several other sites in northern India which include many sites associated with the *Mahābhārata* story, e.g. Mathurā, Ahichchhatrā, Kurukshetra, Barnāwā, etc. The *Mahābhārata* also refers to the washing away of Hastināpura by flood in the Gangā and to the subsequent shifting of capital to Kauśāmbī.
		D E S E R T I O N	
I	Pre-1200 B.C.	'Rolled' fragments of Ochre-coloured Ware; no structures encountered, but very limited area excavated; habitation seems to have been sporadic.	Ochre-coloured Ware also recovered from Bisauli and Rājpur Parsu, the well-known Copper Hoard sites.
		N A T U R A L S O I L	

Owing to the limited area under excavation, no detailed plans of the houses during this Period were obtained. However, remains of mud or mud-brick walls were noted. Since the bricks had mostly disintegrated, it was difficult to ascertain their original dimensions. The presence of mud-plaster with prominent reed-impressions suggested that some of the houses had a reed-walling, which was plastered over with mud mixed with rice-husk (below, p. 124). Whether or not baked bricks were used for building purposes cannot be stated with certainty, since no such structure was encountered, although a fragmentary brick did occur in one of the pits of this Period.

The inhabitants of Hastināpura at this stage used copper[1] as their chief metal, of which an arrow-head, a nail-parer, a borer(?), an antimony rod and a few other fragmentary objects were obtained (fig. 30, p. 96). No iron objects were found, although in the uppermost levels of the Period lumps of iron ore and slags were met with.

The excavation yielded two cylindrical objects, one each of chert and jasper, which were most probably used as weights (pl. L, 5 and 11). However, in the absence of a larger number of specimens, it is difficult to work out their gradation. Also noteworthy was the occurrence of glass bangles[2] in this Period.

The terracotta objects of the Period included animal figurines, discs and one each of feeding cup, pendant and stamp. The figurines were all broken, but the hump in one case suggested that the animal was a bull, while the disposition of the neck and face in another case pointed to its having been a horse (pl. XLII A, 3). The discs were evidently used as game-counters by children. Some of them, having a single or double perforation near the centre, were presumably threaded for spinning just as they are done even now (pl. XLVI, 4 and 10). The feeding cup was provided with a nozzle on one side and a looped handle on the other (pl. XLIX, 9). The pendant, conical in shape, had a hole near the top (pl. XLIX, 11). The stamp bore a design of circlets in the centre and notches along the edge (pl. XLIX, 16).

Amongst other small finds of the Period mention may be made of a whetstone of slate, beads and a variety of bone objects. Of the beads, three were of agate and one each of jasper, carnelian and bone, notable for the shape (pl. LV). The bone artefacts included a reel-shaped object which might have been a gamesman or weight or still

[1] Shri T. R. Gairola, Assistant Archaeological Chemist, has analysed two of the specimens, the percentage-composition of which is as follows :—

	Copper	*Tin*	*Arsenic*	*Antimony*	*Lead*	*Iron*	*Nickel*	*Zinc*	*Total*
HST 1-1126	97·95	·40	·48	·00	·10	·38	·38	·00	99·69
HST 1-1585	97·89	·63	·34	·00	·10	·52	·20	·55	100·23

[2] The two specimens of glass bangles recovered from the Period were examined by Dr. B. B. Lal, Archaeological Chemist in India, who reports as follows. *Specimen no. HST 1-1446* :—It is brownish glass. The typical conchoidal fracture of glass is unmistakable. Its hardness lies between 5 and 6 and its specific gravity is 2·55. The glass is an ordinary soda-lime silicate, containing a small amount of iron which accounts for the brownish colour of the bangle. It is rather soft glass containing a very low percentage of aluminium silica. It was consequently very suitable for the manufacture of bangles. *Specimen no. HST 1-1459* :—This fragment shows a black colour and a clear conchoidal fracture typical of glass. It has a hardness of about 6. Its specific gravity is 2·56. It contains a very low proportion of aluminium and silica. The glass was, therefore, very soft and easy to work. There is no presence of cobalt in this specimen, but iron is present, accounting for the dark colour of the glass. Traces of phosphate have also been detected. Sodium is present in large quantities, but potassium is in traces. The specimen can, therefore, be described as a soft glass of soda-lime type. Both the specimens are more or less fresh and free from weathering and decomposition. It, therefore, seems probable that after fabrication, the bangles were subjected to careful annealing.

something else, a fragmentary bangle and several needle-like pointed tools (pl. LX). The last-named objects are commonly believed to be styli, used for writing. It is, however, difficult to be sure in this respect, since no inscription has so far been reported from the Painted Grey Ware levels, either at Hastināpura or elsewhere. It is equally likely that these pointed implements were used for weaving.

From a pit of this Period were recovered charred grains which Dr. K. A. Choudhury has identified as rice (see below, p. 124). This is of interest since till now rice in India could be dated back only to the first century A.D. It may also be recalled that no rice was found in the excavations at Harappā and Mohenjo-daro.

A study of the animal-remains from the excavation (below, pp. 107 ff.) has thrown much valuable light on the economy and food-habits of the people during this and the subsequent Periods. The occurrence of charred bones of the humped cattle (*Bos indicus*), buffalo (*Bos bubalis*), sheep (*Ovis vignei*), pig (*Sus cristatus*), etc., bearing definite cut-marks on them, shows that these animals were slaughtered for food. The use of beef and pork may perhaps be underlined, since these items fell into disuse, or, at any rate, their consumers began to be looked down upon from the early historical times.

From the fact that the bones of the humped cattle and buffalo were obtained in very large numbers, it is evident that cattle-breeding formed an important occupation of the people. Indeed, in an essentially agricultural society, such as is represented during the Painted Grey Ware Period, maintenance of herds of cattle is what one would normally expect. People also seem to have been fond of hunting the deer, the bones of which were frequently used for making styli and other decorative objects.

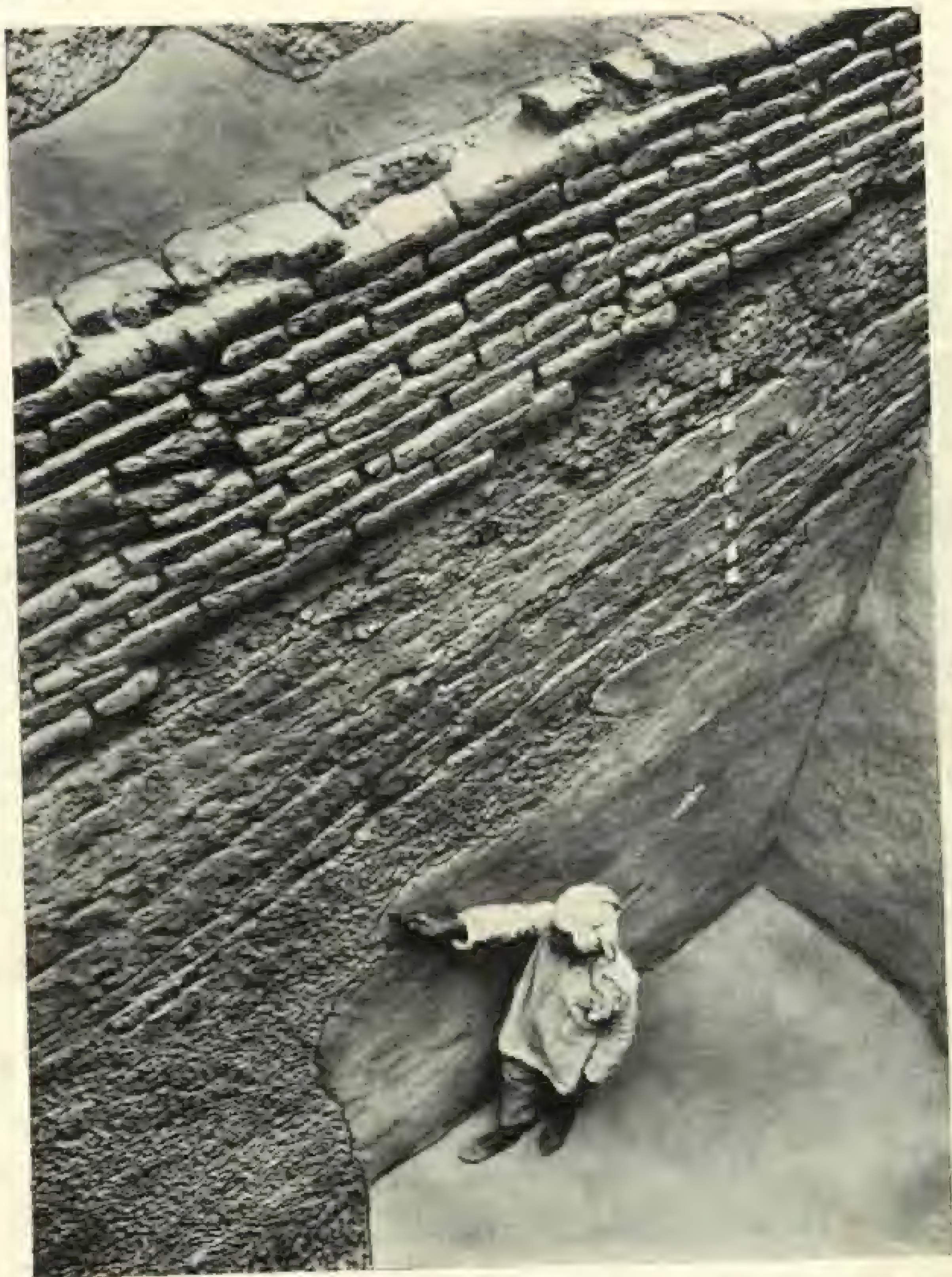
Last but not the least, mention must be made of the occurrence of the skeletal remains of the horse (*Equus caballus*) during this Period. This animal seems to have been absent in the Harappā culture,[1] and its presence during the Painted Grey Ware Period at Hastināpura is indeed significant. According to literary evidence, the horse played an important part in the everyday life of the early Aryans, and if the Painted Grey Ware is to be associated with them, as seems rather probable, the archaeological evidence furnished by the excavation at once assumes a first-rate importance.

The foregoing cultural equipment need not be considered as exhaustive, since the area excavated was very small. There is every likelihood that many a new item lies buried in the unexplored areas. Further digging, especially horizontal, is a desideratum before a detailed picture can be obtained of the Painted Grey Ware levels.

When some 6-7 ft. of occupational strata of Period II had come into being, there occurred a great flood in the river, which cut away a considerable portion of the settlement, as indicated by the erosional scar on the mound (pls. VI and XXIII). While most of the eroded material must have been carried away by the turbulent waters of the river far downstream, a part of it managed to settle down in the river-bed close by. This was revealed by a number of borings made in the Khādar area, within 200 yards of the mound

[1] It has often been debated if the horse was known or not to the people of Harappā and Mohenjo-daro. While the former site has an entirely negative evidence to offer, the latter has yielded a few bones 'on or near the surface' and a terracotta representation (head only) of the animal. Whereas the provenance of the bones would, for obvious reasons, make their antiquity doubtful, doubt also attaches to the identification of the single terracotta representation of the animal's head. One is, therefore, inclined to agree with Marshall that 'although the question is still open, there is no sufficient reason at present for inferring that the horse was known at Mohenjo-daro in Chalcolithic times' [*Mohenjo-daro and the Indus Civilization*, I (London, 1931), p. 28, n.2]. The discovery by E. J. Ross of four teeth of the horse in the lowest levels of Rānā Ghundai (*Jour. Near Eastern Studies*, V, no. 4, 1946, pp. 296 and 316) suggests that the Baluchis had known the animal from very early times; but this evidence does in no way alter the aforesaid position at Harappā and Mohenjo-daro.

To face page 14



HST 1: the erosion-line (pointed out by the man) left by a flood after Period II; above, wall 63 of Period III built on an uneven ground (see also plate XXIII and pages 14 and 25)

To face page 15



HST 1: close view of deposits near erosion-line: A, natural soil, a part of which had also been disturbed and cut; B, dislodged material re-deposited; and C, bands of sand and clay formed during the interval between Periods II and III

(fig. 2; pls. V and XIII A). From them ancient pottery was recovered as many as 45-50 ft. below the subsoil water-level.

The flood, heavy as it was, must have entailed an enormous loss of life and property. The inhabitants seem to have been so much upset that they decided to abandon the site. Consequently, there was no habitation at Hastināpura for some considerable time.

(iii) *Period III*

However, as time rolled on, occupation of the site was resumed by a population which had now completely given up the Painted Grey Ware but had developed another remarkable class of pottery known to archaeologists as the Northern Black Polished Ware. Made of nicely-levigated clay, the ware was well-fired and gave a metallic ring. Though usually jet-black or steel-blue in colour, it was sometimes golden or silvery-white too, having an almost mirror-like surface. By what technique this high shine was achieved has been a puzzling question all along. Experts have expressed their views, but no agreed answer seems to be forthcoming (below, pp. 50-51). While some of the shapes in this ware are derivable from those in the black-slipped and grey wares of Period II, for example, dishes and bowls with straight or convex sides and sagger-base, there are many new ones too. Amongst the latter, mention may be made of *hāndis* with a sharp carination about the middle of the body (fig. 14, 10) and vases with flat base (fig. 14, 6 and 7).

Though the people had given up the Painted Grey Ware altogether, they seem to have had an antiquarian regard for it, perhaps because they saw its fragments lying about in the ancient ruins. This attitude is reflected in a sherd which is a normal specimen of the N.B.P. Ware but has superimposed painting in dull-black colour (fig. 14, 7; pl. XXVI A).

In addition to the N.B.P. Ware, which may be regarded as the ware *de luxe* of the Period, the people used plain grey and red wares too. The grey ware was generally much coarser and thicker in section than its predecessor of Period II, though there seemed to be a generic relationship between the two, since the bowls and dishes were common to both. There were, however, several additional types in the grey ware of Period III, viz. *hāndīs* of the type occurring in the N.B.P. Ware and basins with collared rim and, occasionally, a lip (figs. 16 and 17, XXII-XXV). Some comparatively fine dishes bore, on the interior of the base, impressed designs of concentric circles or rosettes (fig. 16, XVIII). In the red ware, which was generally of a medium fabric and had no slip, the more striking types were: pear-shaped vases (fig. 18, XXXI), carinated *hāndis* (fig. 19, LI), footed bowls (fig. 15, I) and basins with lug-handles (fig. 16, XXa).

For constructing houses, etc., burnt bricks were now used on a fairly large scale, although mud-bricks and sometimes even mud-clods were also employed. Amongst the burnt bricks three sizes were prevalent, viz. (i) 17½ × 10 × 2¾ in., (ii) 14½ × 9 × 2¼ in. and (iii) trapezoidal in shape, 12 × 9 and 6 × 2¾ in. (see p. 106). The mud-bricks generally conformed to the first-mentioned size. The second size, used in a late structure of this Period, is of interest since it also continued into the next Period (IV). The trapezoidal bricks were used essentially for circular structures like barns and cappings of ring-wells, etc., for which they were evidently more suitable than the rectangular ones. In one case, however, they had also been employed in an ordinary wall (pl. VIII, wall 1). In trench HST 1, three structural Sub-periods were noted within the Period, the total thickness of the deposits ranging from 5 to 9 ft. In HST 2, the strata ascribable to this Period averaged 10 ft., and the working levels, too, were more in number, viz. six.

Within the limited area excavated, no details of house-planning, etc., could be expected. In one case, however, a wall (63) was observed to run for nearly 28 ft. without

coming to an end within the excavated area. In another case, three mud-walls (2, 3 and 4) suggested the existence of two rooms, one of which measured at least 15 × 15 ft.

The excavation brought to light two burnt-brick drains belonging to this Period. One of them, drain A, was sunk 3 ft. deep from the ground-level and was provided with a brick floor and lining. It was excavated to a length of 24 ft., beyond which it could not be pursued owing to the superimposed strata. The dimensions of these drains suggest that they were meant to drain out refuse water from a sizable part of the town. Individual houses, however, had their own soakage-arrangement. Several long jars were placed vertically one above the other in a deep pit, and the bottom of every jar was perforated, so that water could pass freely downwards (pls. X and XI A). The excavation also revealed several 'ring-wells'. Made of terracotta, the rings measured about 2 ft. in diameter, 5-6 in. in height and 2 in. in thickness. The number of rings in the wells varied from two in one case to fortyseven (without reaching the bottom) in another (pls. IX, X and XI B). It appears, therefore, that while the shallower examples were used as refuse-pits the deeper ones might have been wells in the real sense of the term.

It was in Period III that the regular use of iron was observed for the first time. This signifies a considerable advance on the technological side and points towards a revolution in the economic condition of the people since the previous Period. The more notable objects in this metal included a barbed and socketed arrow-head, a chisel and a sickle-blade (figs. 31 and 32). Amongst the copper objects of the Period mention may be made of antimony rods, nail-parers and one each of latch (?), ferrule and reel (fig. 30).

Another noteworthy feature of the Period was the existence of a system of coinage. Punch-marked coins, both of copper and silver, as well as uninscribed cast coins of copper were used as currency (pl. LVIII B). The introduction of coinage must have gone a long way in augmenting the trade and commerce of the Period.

A considerable progress was also reflected in the art of clay-modelling during this Period. The animal figurines of the preceding Period appear to be crude when compared with the well-executed figurines of this Period. The elephant seems to have been the most favourite animal. Modelled with graceful contours, specially of the forehead, tusk and the trunk, it was richly decorated with impressed designs of *chakra*, leaves and circles. The eyes were shown with a pierced circle within an incised lozenge (pl. XLIII, 4 and 7). The other animals included a lion (?) and a horse (pl. XLIII, 11 and 6).

Besides animal figurines, human figurines were also met with. But whereas the former were all hand-modelled, the latter included some which were cast in a mould. Female figurines were provided with elaborate head-dress, ear-ornaments and necklaces. Their garments were profuse and flowing. One of them, from a late level of the Period, was to be noted for the parrot that sat over her left hand, while the right hand held a bunch of fruits (pl. XXXVI, 2). Terracottas and even stone images bearing this theme occur at several north Indian sites during the early historical period. Attention was also drawn by a fragmentary female figurine having a thin waist, broad hips and short legs (pl. XXXVI, 4). Of special interest was a therianthropic figure with human face and animal body. The chin was pinched so as to give the impression of a beard. The entire body was decorated with punched circlets, mostly in rows alternating with grooved lines. Pierced through the lower part of the neck was a hole, evidently meant for fastening a string with which the toy could be propelled (pl. XXXVI, 3).

Amongst other terracotta objects mention may be made of a rectangular flesh-rubber (pl. XLVII, 4), a disc with rosette-design on one side and *svastika* on the other and a seal-impression showing loops in four quadrants (pls. XLVI, 3 and XLIX, 10).

Beads, bangles and rings formed an interesting collection of the Period. Leaving aside terracotta beads, which may have been more likely spindle-whorls or net-sinkers, those of crystalline quartz account for the largest number. At one place eleven beads of the material were recovered in a lot, some of which had very nice faceting (pl. LV, 16). Noteworthy were etched beads of carnelian, agate and glass (pl. LV, nos. 4, 22). For bangles, copper seems to have been a favourite material. Special interest attaches to a copper bangle which was provided with a series of holes and a rivet, presumably for adjustments (pl. LIII, 3). The rings were one each of copper, chalcedony and horn (pl. LIV A, 3, 1 and 2). The last-named specimen betrays the fine workmanship of the Period.

The third occupation at Hastināpura came to an end as a result of a large-scale fire, which practically destroyed the whole of the town. Burnt walls and floors and charcoal remains of bamboos, reeds and matting once used in the roofs can now be seen practically throughout the mound in the layer marking the end of the Period (see pl. VIII).

(iv) *Period IV*

After an interval of about a century or so the site was occupied for the fourth time. The cultural equipment of this Period stood in marked contrast with that of the preceding Period. The coarse grey ware of Period III with its characteristic types, for example, dishes, bowls, carinated *hāṇḍīs*, lipped, bowls, etc., was no more to be seen now. Instead, there was exclusively a red-ware industry. The pots were all wheel-turned and generally had a medium-grained fabric with a wash, though finer specimens with a slip also occurred occasionally. Amongst the more important types mention may be made of bowls with incurved rims, spouted basins, button-knobbed lids and lids like ink-pot, bottle-necked sprinklers and *haṇḍā*-shaped miniature vases (figs. 20 and 21, I, XL, XIV, XIII, XV and XXV). Another remarkable feature about the pottery of this Period was the use of stamped and incised decorations. The motifs included *svastika*, *triratna*, fish, leaves, flowers, loops, lozenges, circles and other geometric combinations (pls. XXXI and XXXII). From the upper levels of the Period were also obtained some specimens with designs painted in black pigment (fig. 22, XLI). Examples of this class of painted ware have been noted at several sites in Bikaner, where they are assignable to the first-second centuries A.D. and later.[1]

The houses during this Period were all made of burnt bricks, the size of which averaged 14½ × 9 × 2½ in. For floorings, however, thicker and squarish bricks were used, the dimensions being about 11 × 11 × 4 in. In HST 1 seven structural Sub-periods were recorded. At one place as many as five walls were noted, one above the other, with some débris in between denoting the interval (pl. XVIII).

As to the lay-out of the houses, it was observed that they had a predilection for orientation approximately along the cardinal directions. While complete plans were out of the question because of the limited extent of the dig, interesting evidence in this respect was obtained all the same. Between sectors XL' and LXV' in HST 1, there ran a 16-ft. wide street, roughly north-south, on either side of which stood a house (pl. XXIV). The one to the west measured 42 ft. in length and 20 ft. in width, beyond which it continued into the unexcavated part of the mound (walls 52 and 53). The house on the east had a room 12 ft. in width and more than that in length (walls 42A, 42 and 44, plan incomplete). Attached to this room was a smaller one, 7 × 3 ft., which might have served as a bath, as suggested by a drain which passed close by (drain C). Elsewhere, an opening, about

[1] Information from Shri A. Ghosh.

2 ft. 8 in. wide, was noticed in one of the walls of a room (wall 57B); it was obviously a doorway (pl. XVI A). Mention should be made of a platform (no. 56) which measured over 20 ft. in length and 8 ft. in width, without being completely traced. With a core of brick-bats, it had a nice facing of complete bricks of which seven courses were available.

The excavation also brought to light a ring-well belonging to the Period. The solitary example, however, shows that while the practice of constructing ring-wells continued into this Period, they were certainly less common than in the preceding one.

The copper objects of the Period included antimony rods, pins, stoppers and a small-sized bell (fig. 30, 1, 2, 17, 12 and 11). Amongst the iron objects the nails showed a variety of heads, but more noteworthy were an axe-adze, a sickle, a bell and a pan with lug-handles (fig. 32, 26, 33, 23 and 30).

The terracotta figurines were both hand-modelled and moulded. While those of the former variety were comparatively crude, the moulded figurines represented the art at its zenith, for example, the bust of a female figurine (pl. XXXVII A) and the torso of Bodhisattva Maitreya (pl. XXXVIII), respectively from an early and late level of the Period. The female figure was possessed of highly graceful features, e.g. supple arms, unobtrusively prominent breasts, blooming cheeks and large and sharp eyes, which were further heightened by the exuberance of ornamentation. Further interest attached to the figure of a bird which, seated on her right hand (partly broken), pecked at some foliage. Terracottas executed in this style, commonly known as the 'Śuṅga' style, have a fairly wide distribution over the early historical sites of northern India.[1]

The figure of Bodhisattva Maitreya was remarkable in its own way. The broad chest and shoulders, indicative of masculine firmness, together with the right hand raised in *abhaya-mudrā* made the figure sublime yet graceful. The *dhotī* (lower garment) and the *uttarīya* (upper garment) with their deep folds provided a most pleasant effect in light and shade and incidentally also helped to emphasize the uncovered upper part of the body. The necklace consisting of simple rosettes had its subtle but sure contribution to make in that it broke the monotony and flatness from which the upper part would have otherwise suffered. The *kamaṇḍalu* in the left hand was in keeping with the tradition. The figure was indeed an excellent piece of art and could easily be placed amongst the best terracottas of the period throughout the country. Nay, it even vied with the stone sculptures, for example, those from Mathurā and Ahichchhatrā (below, p. 84), from which it seemed to have derived the inspiration.

In contrast to the above, the terracotta animal figurines evinced a lesser degree of skill, or, at any rate, they suggested that their authors took less interest in them (pl. XLIV). Their indifferent treatment is further brought out when one compares them with their counterparts in the preceding Period (above, p. 16). The most favourite animal of the Period was the humped bull which accounted for the largest number. Amongst other animals mention may be made of the boar, ram and crocodile (pl. XLIV, 19, 15 and 18).

Other terracotta objects of the Period included discs, reels, spindle-whorls, wheels, a toy-cart and votive tanks. Of the discs, one had a figure of tortoise on it (pl. XLVI, 8). The reels, neatly made, bore a design of concentric circles on the sides (pl. XLIX, 6 and 7). The wheels were richly decorated and in two cases showed the spokes as well (pl. XLVIII, 3 and 4). The toy-cart was of interest since roughly similar carts, with shallow pit for seating, are prevalent in that area even now (pl. XLVIII, 2). Votive tanks made their first appearance at Hastināpura about the middle of this Period. They had a walled enclosure, on or against which was seated either a bird or a musician or still something

[1] This particular example from Hastināpura came from a level ascribable to the first century B.C.

else (pls. XLII B and LII B). Votive tanks are known from several other sites like Taxila, Kauśāmbī, Ahichchhatrā, etc., where they belong to a comparable period.

Out of the stone artefacts of the Period, attention was drawn by a large number of lids (pl. L) and a rotary quern (pl. LI A). Made variously of steatite, sandstone and chalcedony, the lids bore incised floral decorations. Their size suggested that they were meant to cover small caskets probably containing toilet-aids or similar material. The rotary quern, coming from a middle level of the Period, was important inasmuch as it marked technically a fundamental improvement over the saddle-quern so common at protohistoric sites in India.

Amongst personal ornaments mention may be made of rings, beads and a pair of talismans(?). One of the rings had a stamped design of a conch (pl. LIV A, 5). The beads were variously of carnelian, jasper and terracotta. Particular interest, however, attached to the jasper beads which showed a high degree of skill in faceting (pl. LV, 17). A carved ivory handle presumably attached to a mirror may also be mentioned (pl. LX, 5).

The excavation also yielded some valuable evidence for fixing the date of the Period. It consisted of two inscribed pots, one inscribed terracotta seal and identifiable coins. The inscription on one of the pots read *Sadhujātasa*, 'of Sadhujāta' (presumably the name of the owner) in characters of about the Christian epoch (pl. LVII A). The pot was obtained from an early level of the Period. The other sherd, coming from a late level, bore the letters . . . *nikasa* . . . , which, on palaeographical grounds, are ascribable to the second century A.D. (pl. LVII B). The seal (pl. LVIII A) was also found in an upper layer of the Period. The inscription, in three lines, read *Thi(?)kaputrasa Jayaśama(?)sa voddisa* (?), 'of . . . (title ?) Jayaśama, son of Thika'.

The coins (pl. LIX) were obtained from various levels of the Period and are, therefore, also cross-checked within themselves. From the early levels were obtained several coins of the rulers of Mathurā which are assignable to the second century B.C. The middle strata yielded coins of the Yaudheya kings dated to a period round about the Christian era. In late level of the Period were found ten coins imitating those of the Kushan king Vāsudeva,[1] which may be dated about the middle of the third century A.D. Above these coins was a further deposit of about 3 ft., embodying one structural Sub-period. It appears, therefore, that the site was deserted towards the end of the third century A.D.

(v) *Period V*

After a considerable lapse of time, a fresh settlement cropped up at Hastināpura towards the end of the eleventh century. As is to be expected, the pottery was now altogether different from what it used to be in Period IV. Made of coarse- to medium-grained clay, the ware was exclusively wheel-turned and had a dull-red colour. An occasional mixture of mica with the clay or a superficial dusting with it over the body before firing gave the pots a welcome lustre. Besides, they were also decorated now and then with incised, stamped and applied patterns which included wavy lines, loops, scrolls, chequers, leaves, creepers, etc. Attention is also drawn by specimens painted over with simple geometric designs in black pigment, though their frequency was comparatively limited. Amongst the outstanding pottery-types mention may be made of *hāṇḍīs* (fig. 28, XXXVI), 'knife-edged' bowls (fig. 26, I), flat plates (fig. 28, XLIII), pedestalled cups with strap-handle probably used as incense-burners (fig. 27, XVII), thick sturdy basins (fig. 26, XI) and lids with hollow conical knobs (fig. 26, XV).

[1] In the section, pl. XXIII, these coins have been mentioned as coins of Vāsudeva.

Apart from the above-mentioned ordinary ware, which persisted throughout the Period, there were the glazed wares, confined in the main to the late levels. They fell under two broad classes. One of them was distinguished by its whitish gritty core, often friable. The only forms represented in this ware were shallow bowls and dishes provided with a ring-base. The pots bore pleasing floral and geometric patterns executed in blue or brown pigments sometimes also supplemented with green (fig. 24; pl. XXXIII). The painted designs along with the rest of the body were covered with a film of glaze which was generally thin but sometimes thick too. This ware made its first appearance at Hastināpura in levels ascribable to the time of Balban (A.D. 1266-87), and it is only reasonable to assume that it was the Muslim conquerors who introduced it at the site.

The other glazed ware had the ordinary terracotta core (figs. 24 and 25; pl. XXXIV). Since the forms represented in it were the same as those in the former glazed ware, it is evident that it was produced in imitation of the former. The painted designs in this case were, however, confined only to the surface exposed normally to the view, i.e. the inner side of flat dishes and shallow bowls. The pigments show a wider range—red, green, dark-brown and cream. The glaze was also generally limited to the interior with an occasional overflow on the exterior.

The structures of the Period had little to boast of, although quite a few of them were found. They were invariably made of brick-bats[1] which were evidently robbed from the ruined walls of Periods III and IV. Noteworthy were: a room about 8 ft. wide and over 11 ft. long (not completely traced; structures 14 and 15); a wall (13) forming a corner with its return-wall and traceable to a length of over 20 ft.; and a flooring now available within an area of 13×8 ft. (pl. XXIV). At the western extremity of HST 1 was encountered a 4-ft. thick wall (86) running across the trench. Though lying at a very low level, it was stratigraphically the latest wall uncovered in the excavation. It was found to retain a mass of débris including pottery of Period V (pl. XXII A). The available evidence thus suggests that this wall might have been constructed, after the regular occupation of Period V had come to an end, by the builders of the structure at the top of the mound near this point (pl. II) in order to hold back the ever-eroding edge of the mound.

The iron objects revealed a great variety of forms, which was natural in a late period like this. The nails were notable for the forms of their head (fig. 31, 1, 3 and 4). The other types included tanged arrow- and spear-heads, knife-blades, hoes, borers, awls, chains, staple and door-rings (figs. 31 and 32, 20, 21, 22, 18, 8, 11, 16, 13 and 14). Amongst the copper objects particular attention was drawn by a bowl (fig. 30, 23; pl. LIV B). It came from a middle level of the Period and not far from it was obtained a coin of Balban (below, p. 104). The other copper objects comprised a nail and a borer. The comparative paucity of copper tools during this Period is quite understandable, since by now iron had replaced copper or bronze in whatever sphere it could.

The terracotta figurines of the Period revealed rather poor workmanship. However, amongst the human figurines attention was drawn by a sculpturesque image of a male and two thin plaques, one depicting a couple (possibly *satti-sattā*) and another a female (pl. XLI, 21, 23 and 24). Done in low relief, the plaques have a style of their own, stiff and geometric. Similar plaques have been found at Ahichchhatrā in the latest levels of Stratum I ascribable to the eleventh century A.D.

The animal figurines had more life about them, although the peculiar treatment in some cases does not fail to strike the eye. For example, while the sharp eyes and the

[1] The house on the top of the mound where trench HST 2 was laid and the wall retaining the southern face of this mound (pls. I and III) are no doubt made of sized bricks of the medieval type. But since these structures are later than those of Period V falling within the trenches proper they have been discounted here.



HST 1: some structures of Period III; right, baked-brick drain A and adjoining wall 1; left, terracotta ring-well 2; and background, mud-brick wall 2 with associated burnt layer (dark) representing conflagration (see also plate XXIII and page 25)



HST 1: close view of terracotta ring-well 2 of Period III, shown on plate VIII



HST 1: devices used for soakage of refuse-water; left, jars with perforated bottom (B); and right, terracotta ring-well 6, both of Period III (see page 25)

To face plate XII



A. *HST 1: soakage-jars A, Period III (see page 25)*



B. *HST 1: terracotta ring-well 5 with only two courses. Period III (see page 25)*



A. *HST 1: baked-brick drain A and the adjoining wall 1, Period III* (see page 25)



B. *HST 1: continuation of baked-brick drain A and wall 1, Period III* (see page 25)

To face page 21



A. *Boring in the Khādar area (see page 30)*



B. *HST 1: barn (?) made of wedge-shaped bricks, Period III (see page 25)*

bridle on pl. XLV, 24 bring the horse nearer the reality, the highly exaggerated neck and beak-like face in 22 and 25 on the same plate make the animals rather farcical. Again, while some interest is aroused by the presence of rider in 26 (same plate), the disposal of the face makes the animal look unusual. An additional feature to note is the hollowness of the body in some cases (e.g. pl. XLV, 22).

Amongst other terracotta objects of the Period mention may be made of dabbers (pl. XLVII, 1, 2 and 3), stamps, spindle-whorls and net-sinkers (pl. LVI). The dabbers had a slightly convex base and a solid or perforated knob. It is most likely that they were used for beating pottery, as is the practice even now, and in the hole might have been inserted a rod for operational facilities. The stamps, which also seem to have been used in pottery-making or similar other work, show a variety of designs.

Particular attention was drawn by the stone images of this Period. They were three in number, made of soapstone and sandstone. Of the two sandstone images one was of Pārvatī, as suggested by the figure of Gaṇeśa in the upper right part of the plaque (pl. XXXVII B, 2). Images executed in a similar style have also been obtained at Ahichchhatrā in the uppermost levels of the site. The other sandstone image (pl. LII A) seems to be that of Ṛishabhadeva, the first Jaina Tīrthaṅkara, in *dhyāna-mudrā* (attitude of meditation). Hastināpura has been a place of pilgrimage for the Jainas for a very long time, and the present image, ascribable to the fourteenth century, is an archaeological indication of it.

The personal ornaments included a variety of bangles and beads. The former were made variously of glass, ivory, shell, bone and terracotta, the glass ones far outnumbering others. An interesting feature about the glass bangles was the stratification of the material in a large number of cases (pl. LIII, 21). The material used for beads included glass, agate, carnelian and terracotta, but it was the etched carnelian beads (fig. 29, 21 and 23) that call for particular attention.

C. CHRONOLOGY

As already indicated above (pp. 19-20), Periods V and IV yielded numismatic evidence to fix their dates. The chronological horizon of Period III is dependent on the dating of the N.B.P. Ware and on allied evidence from early historical sites of northern India. As to the dates of Periods II and I, they have to be worked back, taking the lower limit of Period III as the datum-line.

To recapitulate the evidence regarding the date of Period V. The total thickness of the Period varied from 7 to 9 ft. and there were four clear-cut structural Sub-periods. From a layer falling between Sub-periods 2 and 3 was obtained a coin (HST 1-239) of Sulṭān Ghiyāsu'd Dīn Balban (A.D. 1266-87), and accordingly the layer concerned may be assigned broadly to the close of the thirteenth century A.D. That this layer could not have been much later than that is suggested by the fact that the lower levels of the Period yielded pottery-types (e.g. *hāṇḍī* with partially-indented rim, double-spouted vases, knife-edged bowls, incense-burners, etc.) which occurred at Ahichchhatrā between A.D. 850-1100. To strike a compromise, the beginning of Period V may be placed late in the eleventh century. The Glazed Ware (above, pp. 19-20) recovered from the upper levels of the Period is similar to that found at 'Ādilābād, where it is firmly dated to the first half of the fourteenth century.[1] Mention may perhaps be made here of a coin (HST 1-1072) of Sulṭān Maḥmūd Shāh II (A.D. 1392-1412), though it was picked up on the surface. If this coin had any connexion with the archaeological strata revealed by the

[1] H. Waddington in *Ancient India*, no. 1 (1946), pp. 72 ff.

excavation—a probability which cannot be completely ruled out—Period V would seem to have continued till the beginning of the fifteenth century.

Period IV yielded a fairly large number of coins; and of additional importance is the fact that they were distributed throughout the Period, from its beginning till almost the end, so that their dating evidence is easily cross-checked. From the lower levels of the Period were obtained five coins of the rulers of Mathurā, including two coins of Śeshadatta. Though no absolute dates can be fixed for these kings, it is agreed on all hands[1] that they ruled during the second century B.C. The fourth occupation of Hastināpura may, therefore, be supposed to have commenced during the régime of these Mathurā rulers some time in the first half of the second century B.C.

The next series consisted of the 'bull-and-elephant' type of Yaudheya coins. Though their main concentration was during the structural Sub-periods 4 and 5, one specimen occurred as low as Sub-period 3. According to Vincent Smith, these coins 'may be dated a little before or after the Christian era'.[2] It may, therefore, be reasonable to assign Sub-period 3 to the second half of the first century B.C. and Sub-periods 4 and 5 to from the beginning of the Christian era to the first half of the second century A.D.

Associated with Sub-period 6 were ten imitation coins of the Kushan king Vāsudeva.[3] Since the entire Kushan chronology is still under dispute, it is difficult to be definite about the date of Vāsudeva as well. According to Smith, he may be placed between A.D. 185-220. Above these coins there was another Sub-period. The latest levels of Period IV may, therefore, be assigned to the late third century A.D.

It is known that Period III came to an end as a result of a large-scale fire which destroyed practically the whole of the town and that the site was abandoned for some time to come. What could be the duration of this gap it is very difficult to say. It is, however, seen that the pottery of the succeeding Period, IV, was altogether different from that of Period III. Now, if the same people gradually developed the new pottery-types, the time involved may be somewhat long. On the other hand, if a different people were responsible for the pottery of Period IV, the time-lag could be anything. One thing, however, is definite that there was no overlap between Periods III and IV. On a moderate estimation, therefore, the end of Period III may perhaps be placed somewhere in the first half of the third century B.C. In cutting HST 1 the thickness of the occupational strata of the Period varied from 5 to 9 ft. and three well-separated structural Sub-periods were noted. In HST 2, however, the thickness of the strata was consistently 9 ft. or slightly over. Though the number of walls in this case was very limited, there were indications, such as post-holes, buried pots, ironsmith's slags, etc., to show that there had been about six occupational Sub-periods. One is, therefore, inclined to assign a period of at least three centuries to these deposits and thus place the beginning of Period III early in the sixth century B.C.

The above dating can also be cross-checked by the evidence of the N.B.P. Ware, which occurred throughout the Period. In this connexion attention may be drawn to the stratigraphical position of this ware at the well-known sites of Kauśāmbī and Taxila. A representative section of the lower strata of Kauśāmbī is available at KS III, C1. Here, the first three layers above the natural soil, viz. layers 27 to 24, yielded sherds of grey ware, though only four in number.[4] They included fragments of bowls, one of which was also

[1] Cf. Vincent A. Smith, *Catalogue of the Coins in the Indian Museum, Calcutta* (Oxford, 1906), p. 192.

[2] *Ibid.*, p. 165.

[3] See above, p. 19, n.

[4] The author is much indebted to Shri G. R. Sharma of the Allahabad University for the information regarding Kauśāmbī. While the limited number of potsherds indicates that this particular spot may not have been under regular occupation, their presence does point to the existence of a pre-N.B.P. Ware settlement somewhere in the neighbourhood.

painted with a simple band round the rim in black pigment. Above these layers was a sterile deposit of clay, about 6-7 ft. in thickness. The first layer overlying this clay, viz. layer 16, yielded the N.B.P. Ware, which continued till layer 8. The total thickness of the N.B.P. Ware-bearing strata was about 8 ft., wherein were noticed six occupational phases during which mud or mud-bricks were used and two further phases having structures of kiln-burnt bricks. From layer 7 upwards were obtained coins of the Mitra rulers of Kauśāmbī, assignable to the second century B.C. This shows that the N.B.P. Ware had come to an end by the beginning of that century. With this as the upper limit, and with eight occupational phases to go by, the beginning of the N.B.P. Ware at Kauśāmbī may safely be assigned to early sixth century B.C.

The evidence from Taxila has been discussed in full detail by Wheeler and Krishna Deva.[1] Of the total of about twenty sherds, two came from Sirkap and eighteen from Bhīr Mound. Of the Sirkap sherds, one came from the lowest levels of the site ascribable to the second century B.C., while the other was found near Hathiāl range without any proper stratification. Amongst the eighteen sherds from Bhīr Mound, only one was found within 6 ft. from the surface, while the remaining lay between 6 and 13 ft. below surface. The occurrence of Alexander's coins in mint-condition at an average depth of 6 ft. below surface shows that that level is ascribable to *circa* 300 B.C. It would, therefore, follow that the N.B.P. Ware at Taxila is essentially pre-Alexandrian and, with 7 ft. of occupational deposits between the Alexandrian level and the lowest N.B.P. sherds, the Ware may well have appeared at the site some time during the sixth century B.C.

Thus, the evidence from Kauśāmbī and Taxila duly upholds the dating proposed above for Period III at Hastināpura.

Now to the dates of Periods II and I. As already stated (p. 14), a heavy flood in the Gangā washed away a part of the settlement of Period II and that the third occupation came into being after an appreciable lapse of time. During this interval the people had completely given up the Painted Grey Ware and had developed instead the Northern Black Polished Ware. The plain grey ware had also degenerated to a considerable degree and several new forms had come into being. Mud-bricks were replaced by burnt bricks, iron had come into use and a system of coinage introduced. All this change would have certainly required a couple of centuries. Thus, since the lowest level of Period III is assignable to the early sixth century B.C., it is unlikely that the flood could have occurred later than the beginning of the eighth century. With this as the upper limit for the end of Period II, and with about 7 ft. of regular occupational strata belonging to the Period, it is for any body to guess the probable date of its beginning. However, in the general context of the site about three centuries would seem a fairly conservative estimate for the accumulation of these strata, and consequently the lowest levels of the Period may be assigned to *circa* 1100 B.C., with a probable margin on the earlier side.

Since there was a break of occupation between Periods II and I, *circa* 1200 B.C. may be a reasonable upper limit for the latter. For an absolute chronology of this Period, however, further results from comparable sites must be awaited.

To sum up, the various Periods at Hastināpura may be dated as follows:—

Period I: pre-1200 B.C.
Period II: *circa* 1100 to *circa* 800 B.C.
Period III: early sixth to early third century B.C.
Period IV: early second century B.C. to the end of third century A.D.
Period V: late eleventh to early fifteenth century A.D.

In order to demonstrate the chronological relationship of these Periods with the occupational strata at some of the protohistoric and early historical sites of northern India,

[1] *Ancient India*, no. 1 (1946), pp. 55-56.

DATES	HASTINĀPURA	AHICHCHHATRĀ	KAUŚĀMBĪ	TAXILA	KOṬLĀ-NIHANG
A.D.1600					
1400					
1200	PERIOD V				
1000		STR. I			
800		STR. II			
600	BREAK				
400		STR. III	GUPTA LEVELS	SIRSUKH	
200		STR. IV	KUSHAN LEVELS		
0	PERIOD IV	STR. V			
		STR. VI	MITRA LEVELS	SIRKAP	
B.C.200	BREAK	STR. VII			
400	PERIOD III (N.B.P. WARE)	STR. VIII STR. IX	N.B.P. DEPOSITS	BHIR MOUND	
600	BREAK	?	PRE-N.B.P. DEPOSITS		
800	? PERIOD II (P.G. WARE)	P.G. WARE	NATURAL SOIL		?
1000	?	? NATURAL SOIL			P.G. WARE
	BREAK				?
1200	? PERIOD I				BREAK
1400	? NATURAL SOIL				?
1600					HARAPPĀ CULTURE

Fig. 3

a tentative table is appended (fig. 3). This correlation, however, is only approximate and need not be taken as final.

D. The cuttings

As already stated above (p. 10), four trenches, HST 1 to HST 4, were laid out at Hastināpura (pl. V). A brief description of the trenches with particular reference to the structures, ring-wells and other important features is given below.

(i) *Site HST 1* (pls. XXIII and XXIV)

On the eastern side of the mound, where the trench terminated, there was a rain-gully in which a brick drain and a ring-well (drain B and ring-well 1 on the plan) could be seen even before excavation (pl. IV). The gully was both wide and deep and at places the natural soil could also be seen. It was, therefore, thought worth while to scrape the sides of the gully so that a preliminary idea of the stratification of the site might be obtained with the minimum of effort. Accordingly, the gully was trimmed into a trench, which measured 44 ft. in width and 52 ft. in length. When some stratification was revealed, the trench was further extended westwards by 60 ft. The most baffling thing, however, was the absence of the Painted Grey Ware strata from this side of the mound. The best course, therefore, was to carry the trench right across the mound to its western face, where the Painted Grey Ware could be picked up from the section. The overall length of the trench thus became 590 ft., of which 60 ft. in the middle remained unexcavated. The width in the extended portion was, however, limited to 21 ft., since within the time and funds at disposal it was not possible to excavate the entire width of 44 ft.

When the entire cross-section was exposed, the reason for the absence of the Painted Grey Ware strata from the eastern part became clear. It was revealed that a large-scale flood in the Gangā had washed away these strata from the eastern side (the side nearer the river). This was attested to by the existence of a sharp erosion-line and also by bands of sand and clay which accumulated during the interval between the end of the Painted Grey Ware period and the beginning of the following occupation (pls. VI and VII).

It has already been mentioned previously (p. 10) that all the five Periods were encountered in HST 1. The structures, ring-wells, etc. belonging to these Periods are enumerated below.

Period I.—No structures were found in this Period. This may perhaps be due to the limited extent of the area excavated.

Period II.—Fragmentary walls of mud or mud-bricks were encountered, but no regular house-plan could be obtained. Mention may also be made of a number of hearths in the upper levels of the Period (pl. XXIV).

Period III.—In it three structural Sub-periods were noted. To *Sub-period 1* belonged: drains A and B together with their adjacent wall, 1 (pl. XII); wall 40; ring-well 2, of which fortyseven rings were noted without reaching the bottom (pl. IX); and ring-well 5, which had only two courses (pl. XI B). Assignable to *Sub-period 2* were: mud-brick walls 2, 3 and 4 (pl. VIII), forming part of a house; ring-well 3, consisting of twentyfive rings (bottom not reached); ring-well 6, having eleven courses (pl. X); soakage-jars B, which had perforated bottoms (pl. X); and a barn (?) of wedge-shaped bricks (pl. XIII B). Soakage-jars A (pl. XI A) might have also belonged to this Sub-period, but the stratigraphy was not clear. To *Sub-period 3* were ascribable: flooring 1; ring-well 4, having twentyfour courses of rings (bottom not reached) and superimposed by five courses of wedge-shaped

bricks; and wall 63, over 28 ft. long and available to a height of thirteen courses (pls. VI and XV B). Built against a slope, the wall had a stepped bottom. It was associated with the burning which brought about the end of Period III.

PERIOD IV.—It had seven structural Sub-periods.

Of *Sub-period 1*, only three structures, 39, 48 and 64, were noted. Wall 39 was available to a height of three courses. Its entire width could not be exposed owing to the baulk lying over it. Wall 48 underlay wall 47 and thus no other details save the number of courses, five, were recorded (pl. XVIII). Wall 64 was very fragmentary and three of its courses could be seen.

To *Sub-period 2* were ascribable walls 5, 38, 47 and 61 and flooring 2. No. 5 was a fragmentary little wall, only one brick in thickness. No. 38, exposed only to a length of about 4 ft., had two courses. No. 47 lay under wall 46 and could consequently be observed only in elevation, five courses being traceable (pl. XVIII). Of structure 61, as many as twelve courses were obtained. Towards its western extremity it underlay platform 56. Associated with flooring 2 (pl. XXI A) was found a coin (HST 1-181) of the rulers of Mathurā.

Belonging to *Sub-period 3* were walls 6, 7, 34, 35, 35A, 35B, 36, 37, 43, 46, 56, 57, 57A, 57B, 57C, 62, 69, 96, 98 and 100; flooring 4; a series of post-holes and ring-well 1. No. 6 was a part of a massive wall, over 2 ft. 4 in. in thickness and available to a height of fourteen courses (pl. XIX B). Of wall 7, seven courses were available. It might have formed a cross-wall against wall 6. No. 34 was a fragmentary structure of brick-bats. Wall 35 was very thick and had twelve courses, 35A and 35B forming its cross-walls. Structure 36 was fairly wide and had eight courses. No. 37, of which only the edge was traced, had nine courses. No. 43 was a flooring, partly built of brick-bats and edged by a wall of two courses. Wall 46, of which seven courses were available, had a stepped bottom (pl. XVIII). No. 56 was a huge platform having the core of brick rubble with the facing of complete bricks. Available to a length of over 20 ft., it had seven courses. Walls 57, 57A, 57B, 57C and 62 formed two adjacent rooms. In wall 57B was also observed a doorway, 2 ft. 7 in. wide (pl. XVI A). Of wall 69, which ran obliquely in the trench, seven courses were met with. Walls 96 and 98 were fairly thick and each had its return-wall. It appears that these two walls, together with walls 6 on one side and 35 on the other, formed an important structural set of the Sub-period. With wall 96 also went flooring 4. Wall 100, observed in elevation only, had seven courses. Ring-well 1 belonged to Period IV, but the exact Sub-period could not be determined since the upper courses had been knocked off by a subsequent pit. The post-holes, running in double rows, formed an interesting plan (pl. XVII).

To *Sub-period 4* were assignable structures 45, 67, 68, 71 and 88. Wall 45, having seven courses, was observed in elevation only. Of wall 67 a part was robbed, but it probably joined the set of structures numbered 68. In this complex was noted a room, about 4 ft. wide and having a brick flooring. Wall 71 was available to a height of four courses. Wall 88, built of rubble, partly underlay flooring 7.

Within *Sub-period 5* fell walls 31, 32, 33, 42, 42A, 42B, 44, 52, 53, 54, 58 and 87; floorings 3, 6 and 7; and drain C. Wall 31, running east-west, overlay wall 35 and was available to a height of six courses. No. 32 also ran east-west. Of wall 33, five courses were recorded. Walls 42, 42A, 42B, 44 and drain C formed a single structural unit (pl. XVI B). It comprised two rooms, one of which measured 7 × 3 ft. and another about 12 ft. in width, the length being not completely exposed. Wall 52 was over 36 ft. in length and, with its return-wall, 53, seemed to form the compound-wall of some large building. The bottom of 52 was stepped with a slope to the east. At one point as many as twentytwo courses were observed in it. No. 54 was a pylon-shaped structure, having twelve courses of



HST 1: general view of structures, looking west

To face plate XVI



A. *HST 1: section cut through mud-brick wall 3 and an associated clay-lined pit, Period III* (see page 25)



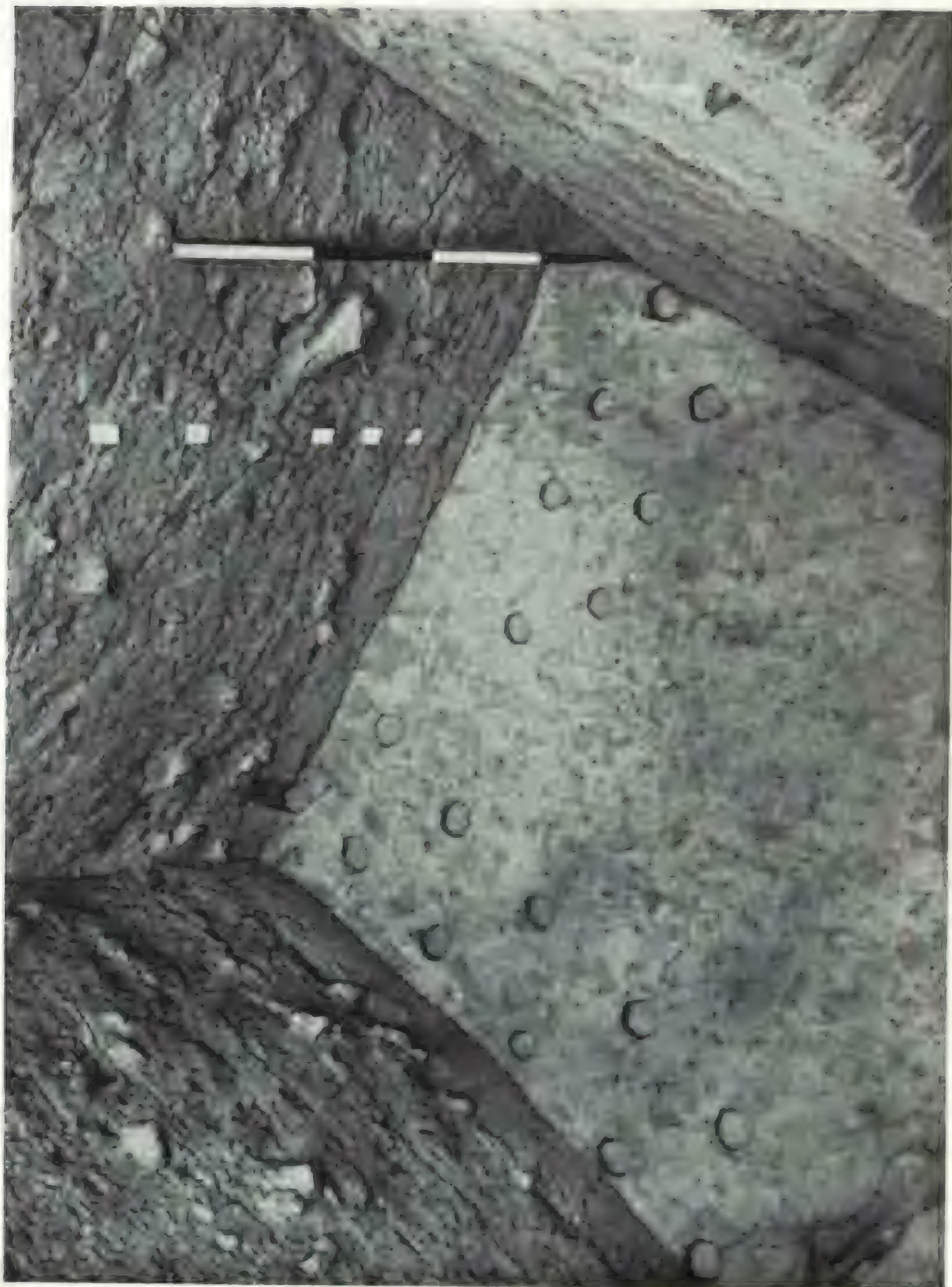
B. *HST 1: retaining wall 63, showing projection for bonding. Period III* (see page 25)



A. *HST 1: a room with door-sill (walls 57, 57A and 57B), Period IV (see page 26)*



B. *HST 1: walls 41, 42, 44, etc., and drain C, Period IV (see page 26)*



Hut 1: post-holes, Period II (see page 26)



HST 1: five successive walls, 48, 47, 46, 42 and 41 of Period IV (see also plate XX and pages 26-27)

To face plate XX



A. *HST 1: walls 87 and 97 and flooring 7, Period IV* (*see pages 26-27*)



B. *HST 1: wall 6, Period IV* (*see page 27*)



A. *HST 2: structures of Period V* (see page 27)



B. *HST 1: walls 12, 11, 13, 9A and 9, Period V* (see page 27)

To face plate XXII



A. HST 1: *flooring 2 and other structures, Period IV* (*see page 26*)



B. HST 1: *flooring 6 and wall 58, Period IV* (*see page 26*)



A. *HST 1: walls 79 and 80, Period V: a late medieval structure in the background* (*see page 28*)



B. *HST 1: retaining wall 86, possibly built after Period V* (*see page 27*)

which some were tilted (see pl. XIV). All the three structures, viz. 52, 53 and 54, seem to have continued into Sub-period 6 as well. Wall 58 and flooring 6 went together (pl. XXI B). In the latter were used squarish bricks, measuring about 11½ × 11 × 4 in. Wall 87 ran north-south and with it went flooring 7, covering an area of about 7 × 8 ft. (pl. XIX A). Flooring 3, along with a fragmentary wall, was encountered in the north-western corner of the rain-gully.

Ascribable to *Sub-period 6* were structures 28, 29, 30, 41, 52, 53, 54, 59, 60, 85, 85A and 97. Of wall 28, six courses were obtained. On the floor associated with it were found ten imitation coins of king Vāsudeva[1] of the Kushan dynasty. Wall 29, lying to the east of 28, was comparatively fragmentary. Of wall 30, which had five courses, the full width was not exposed. Wall 41 overlay wall 42 and may perhaps be regarded as its continuation (pl. XVIII). Similarly, walls 52, 53 and 54, originally built in Sub-period 5, remained in use during this Sub-period as well. Walls 59 and 60 were too fragmentary to yield any plan. The former had a stepped bottom and was available to a height of four courses. Wall 85 ran obliquely in the trench for a length of about 10 ft. and had a cross-wall, called 85A, joining it. Wall 97 lay very close to wall 87, which indicated that the people who constructed the former were aware of the latter (pl. XIX A).

To *Sub-period 7* belonged walls 25, 26, 27, 27A, 50, 51, 65, 66, 81, 82, 83, 84, 84A and 99. Of wall 25 only four courses were obtained. Wall 26, made of fragmentary bricks, was available to a height of four courses. Wall 27 also had four courses. Butting on it was wall 27A, the two forming parts of the same house. Walls 50 and 51 marked a departure from the alignment of earlier structures. The former, over 13 ft. in length, was available to a height of three courses. Of wall 65 as many as eight courses were obtained. Wall 66, only one brick thick, ran to a length of over 20 ft. Structure 81, available to a height of five courses, was perhaps a part of a platform. Structures 82, 83, 84 and 84A formed parts of a single unit. Attention here was drawn by a circular platform or pillar-base (?). Wall 99 was very fragmentary.

Period V.—Within it four Sub-periods were noted. The thick retaining wall, 86, at the western extremity of the trench appears (pl. XXII B) to have been built by the people who also put up the structure at the top of the mound. It does not, therefore, fall within the limits of Period V proper.

Assignable to *Sub-period 1* were walls 16A, 20, 20A, 20B, 21, 21A and 24. Wall 16A, tilted towards the north, had five courses. Walls 20, 20A and 20B formed parts of a single structure. In wall 20, six courses were observed. Wall 21 possibly joined wall 21A, thus forming two sides of a room. Of wall 24, which had as many as fourteen courses, only a limited length was exposed.

Within *Sub-period 2* fell structures 11, 12, 13, 14, 15, 15A, 16, 19, 22, 23, 72 and 78. Walls 11 and 12 joined each other at an acute angle (pl. XX B). The former, available to a length of 9 ft., had three courses. Walls 14, 15 and 15A formed a room, 7½ ft. wide and over 11 ft. in length. Of wall 14, seven courses were obtained. Traced up to a length of 13 ft., wall 16 had eight courses. Of wall 19, four courses were obtained. Structure 22 represented the corner of a room. Alongside it was also a bit of another wall. Of wall 23, which had fourteen courses, only a small length was exposed. Wall 72 was very fragmentary. Wall 78, of which only a part was exposed, had four courses.

To *Sub-period 3* belonged walls 8, 10, 17, 18, 23A, 73, 73A, 75 and 80 and flooring 5. Running north-south, wall 8 had eight courses. Walls 10 and 17 lay respectively to the south and north of wall 21A. The former had three courses and the latter only two. The set of structures numbered 18 included a north-south wall and a bit of another

[1] See above, p. 19, n.

wall meeting the former at right angles. Both had six courses. Structure 23A, over 15 ft. long and 2 ft. 9 in. wide, was made of very fragmentary bricks. Being only one course high, it may have been a pavement. Available to a length of 14 ft., wall 73 had three courses. Wall 73A met the former at right angles. Wall 75, consisting of four courses, was roughly parallel to wall 73. Of wall 80, which underlay wall 79, only a short length was exposed (pl. XXII A). It had, however, eleven courses. Flooring 5 covered an area measuring approximately 14 × 8 ft.

Ascribable to *Sub-period 4* were walls 9, 9A, 74, 74A and 79. Walls 9 and 9A formed parts of the same structure. The former was obtained to a length of 18 ft., in the western part of which were also used blocks of lime-*kankar* in addition to brick-bats. Walls 74 and 74A represented the corner of a room. Traced to a length of 16 ft., wall 79 had five courses (pl. XXII A).

(ii) *Site HST 2* (fig. 4)

This trench was laid primarily to cross-check the evidence obtained from HST 1. In its entirety it measured 180 ft. in length (pl. V). It was, however, only the eastern extremity, about 40 ft. in length, which fell on the main height of the mound and thus revealed all the five Periods. The remaining portion of the trench lay on the slope wherein only late structures, ascribable to Period V, were met with. It was planned to keep the width of the trench 12 ft. throughout, but in the eastern part it had to be reduced to 6 ft. in the lower strata. Within this meagre width it was obviously difficult to obtain any intelligible house-plan. The presence of walls, post-holes, floorings, etc., however, clearly indicated various occupational levels, and these are briefly enumerated below.

The layer yielding the Ochre-coloured Ware of Period I had been greatly disturbed (fig. 4). During Period II the walls were made of mud or mud-bricks. In the section are shown two of the mud-walls (19A and 31), falling in the upper half of the Period. In the lower half two more floor-levels were observed, although the walls associated with them were not clear.

The thickness of the deposits belonging to Period III averaged 10 ft. Within it as many as six Sub-periods were noted, each represented by a wall either of mud-bricks or burnt bricks. In the illustrated section, however, occur only walls 16 and 10, associated respectively with the last two Sub-periods. On the floor associated with wall 10 were also found iron slags in huge quantities, indicating large-scale iron-smelting in the locality.

During Period IV, site HST 2 was not so much under occupation as site HST 1. This is suggested both by the thickness of the strata, which was about 4 ft., and by the structural Sub-periods, which numbered only two.

Period V had three structural Sub-periods, to the uppermost of which belonged the flooring and walls illustrated on pl. XX A.

(iii) *Site HST 3*

The mound where trench HST 3 was laid was very low compared with the neighbouring mounds. Herein only one set of structures, belonging to Period V, was encountered. This occupation had evidently come up after the mound had been eroded.

(iv) *Site HST 4*

Like the previous trench, HST 4 was also laid at a very low level. The pottery evidence showed that this area too was occupied during Period V only. Within it there

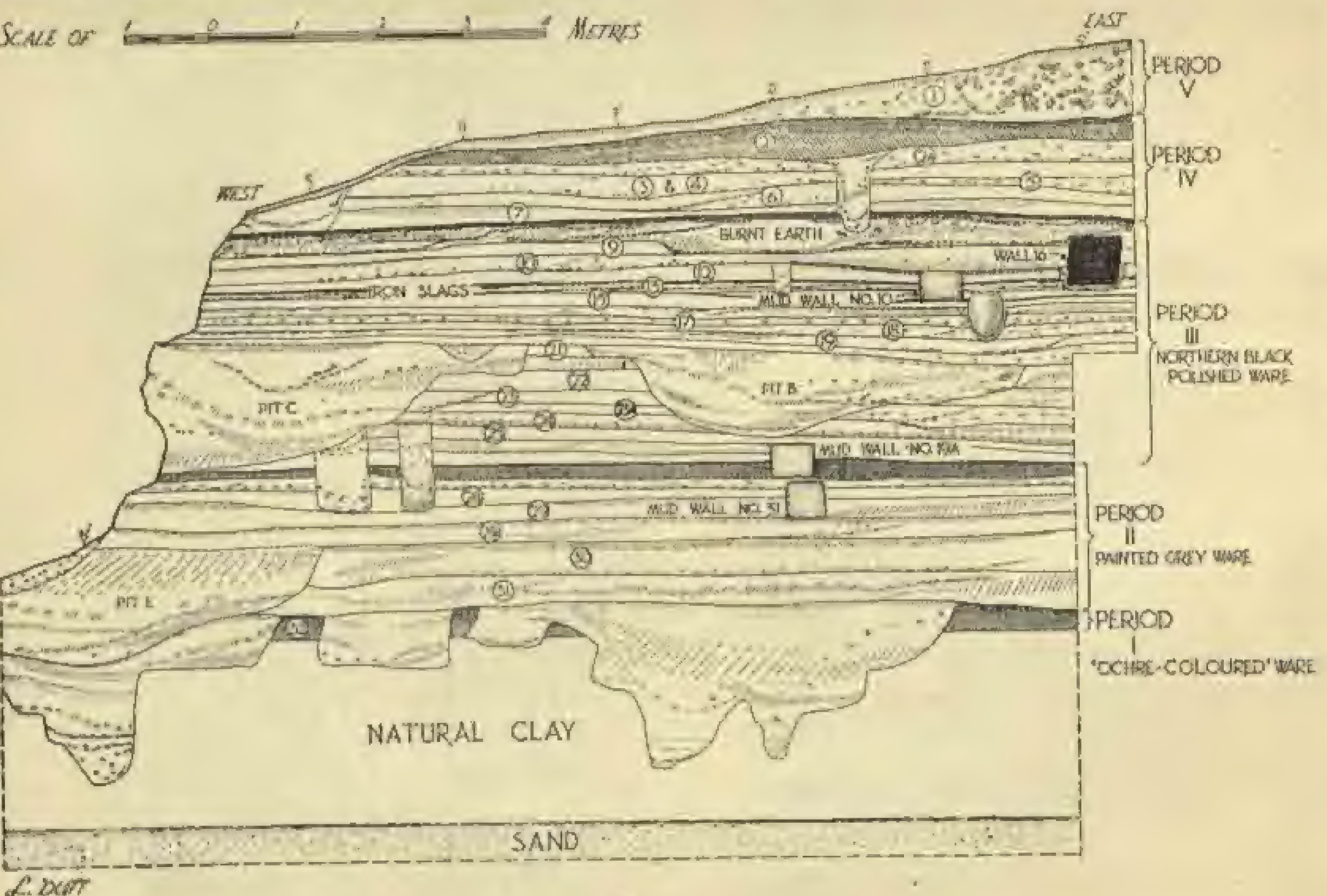

HASTINAPURA 1950-51. SITE HST 2. SECTION
SCALE OF FEET
SCALE OF METRES
EAST
WEST
PERIOD V
PERIOD IV
PERIOD III
NORTHERN BLACK POLISHED WARE
PERIOD II
PAINTED GREY WARE
PERIOD I
'OCHRE-COLOURED' WARE
BURNT EARTH
WALL 16
IRON SLAGS
MUD WALL NO. 10
MUD WALL NO. 10A
MUD WALL NO. 51
PIT B
PIT C
PIT E
NATURAL CLAY
SAND
L. DUTT

Fig. 4

were two structural Sub-periods. Attention was also drawn by two circular ovens resembling the modern *tandūr*.

E. The borings

When in the course of the excavation of the mound it was revealed that a part of the settlement of Period II had been washed away by the river, a natural question arose if the washed material could be traced in its old bed. It was, therefore, felt that a few borings in the Khādar area might be useful in this direction. Accordingly, six borings, each having a diameter of 4 in., were made at points sufficiently removed from one another so that the evidence might be cross-checked (pl. V). In boring 1 (pl. XIII A), which lay in the alignment of trench HST 1, ancient pottery was found mixed up with river-pebbles at a depth of 45-50 ft. below the Khādar level, the subsoil water being only about 5 ft. below the surface (fig. 2). Since the Khādar is itself nearly 45-50 ft. below the natural soil in the mound, it would mean that the pottery had been carried down to a depth of nearly 90 ft. from its original place. This might appear to be too much of a displacement but may perhaps be explained by the fact that the river might have scoured its own bed at the time of the flood. The occurrence of layers of silt and sand in the upper part of the boring indicated that the present level of the Khādar was not reached all at once but that it gradually continued to rise after the initial deposition at the subsidence of the flood. The same story was repeated in other borings also. Borings 5 and 6, not shown on pl. V were done at a distance of nearly one furlong to the east of the mound in order to ascertain the extent of the deposition.

F. The pottery[1]

(i) *Introductory*

The pottery-evidence from Hastināpura is remarkably unique. The entire pottery falls into five distinct groups, each of which presents a good deal of individuality and forms a characteristic adjunct to the corresponding period to which it belongs. Apart from the ordinary plainer wares, three industries, viz. the Painted Grey Ware, the Northern Black Polished Ware and the pre-Mughul Glazed Ware, being of special importance, have been dealt with separately. Excepting a few stray examples, hand-made only to a modified degree, the entire range is wheel-made. The broad features of each group are enumerated here.

The earliest group is distinguished by a red ware of medium to coarse fabric and treated with an ochre-wash in the nature of a slosh. The ware is distinctly underfired and rubs off very easily.

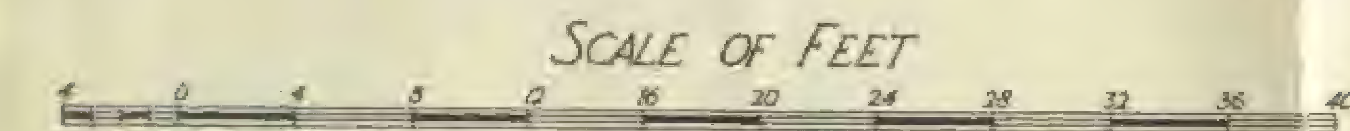
It is followed by a group of pottery in which the Painted Grey Ware figures very prominently. The individual features of this Ware are described elsewhere (below, pp. 32-33); meanwhile all that need be said is that the industry is very distinctive and with a wide distribution (cf. fig. 1). At all of these sites the Ware occurs in the lower levels in a known sequence. The chief characteristics of this pottery are grey colour, fine thin well-burnt section and profusion of painted designs, both linear and dotted, generally in black. The other industries in this group comprise a dull-red ware mainly of coarser fabric, an essentially plain, red-slipped ware of finer fabric and a polished black ware.

[1] This section has been contributed by Shri B. K. Thapar.

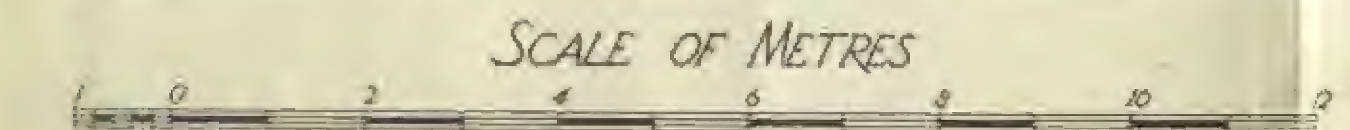
To face page 30

HASTINĀPURA 1950-52: SITE HST 1, *SECTION LOOKING SOUTH*

SCALE OF FEET

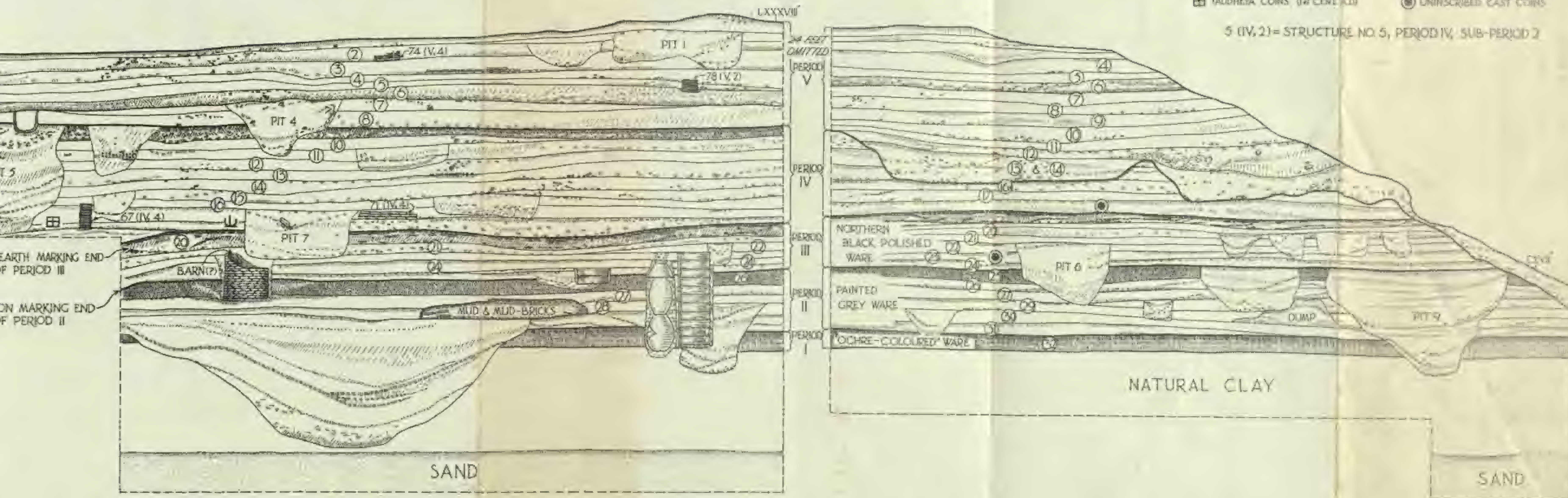


SCALE OF METRES



PERIOD V
PERIOD IV
PERIOD III
PERIOD II
PERIOD I
120 FEET OMITTED
24 FEET OMITTED
PIT 1
PIT 2
PIT 3
PIT 4
PIT 5
PIT 7
RING-WELL 1
RING-WELL 2 (III, 1)
RING-WELL 4 (III, 3)
DRAIN (III, 14)
NATURAL SAND
NORTHERN BLACK POLISHED WARE
BURNT EARTH
BANDS OF SAND & CLAY
ACCUMULATION FOLLOWING THE EROSION
NATURAL CLAY
SAND
BURNT EARTH MARKING END OF PERIOD III
EROSION MARKING END OF PERIOD II
BARN(?)
MUD & MUD-BRICKS

L. DUTT



COIN OF BALBAN (A.D.1266-87) IN EQUIVALENT LAYER
COINS OF VĀSUDEVA (A.D.185-220) IN EQUIVALENT LAYER
YAUDHEYA COINS (1ST CENT. A.D.)
MATHURĀ COINS
PUNCH-MARKED COINS
UNINSCRIBED CAST COINS
5 (IV, 2) = STRUCTURE NO. 5, PERIOD IV, SUB-PERIOD 2
LXXXVIII
24 FEET OMITTED
PERIOD V
PERIOD IV
PERIOD III
PERIOD II
PERIOD I
PIT 1
PIT 4
PIT 5
PIT 6
PIT 7
PIT 9
74 (V, 4)
78 (V, 2)
67 (IV, 4)
71 (IV, 4)
EARTH MARKING END OF PERIOD III
ON MARKING END OF PERIOD II
BARN(?)
MUD & MUD-BRICKS
NORTHERN BLACK POLISHED WARE
PAINTED GREY WARE
'OCHRE-COLOURED' WARE
DUMP
NATURAL CLAY
SAND
SAND

To follow plate XXIII

5

RING-WELL 1 (IV)

5 (IV, 2)

DRAIN B (III, 1A)

FLOORING 2 (IV, 2)

8 (V, 3)

FLOORING 1 (III, 3)

6 (IV, 3)

1 (III, 1)

DRAIN A (III, 1A)

RAIN GULLY

SOAKAGE JARS A (III)

3 (III, 2)

RING-WELL 2 (III, 1)

FLOORING 3 (IV, 5)

4 (III, 2)

2 (III, 2)

MUD BRICKS

2 (IV, 2) = STRUCTURE No. 2, PERIOD IV, SUB-PERIOD 2

SCALE OF FEET

6 0 12 24 36



HASTINĀPURA 1950-52: SITE HST 1, *PLAN*

CONTINUED BELOW LEFT

CONTINUED FROM TOP RIGHT

RING-WELL 4 (III, 5)

RING-WELL 5 (III, 1)

RING WELL 6 (III, 2)

DRAIN C (IV, 5)

DOOR-SILL

HEARTHS (II)

BARN (III, 3)

FLOORING 4 (IV, 3)

FLOORING 5 (V, 3)

FLOORING 6 (IV, 5)

FLOORING 7 (IV, 5)

POST-HOLES (IV, 3)

JAR (III)

86 (*LATE RETAINING WALL*)

SCALE OF METRES

4 8 2 0 2 4 6 8 10 12

S.P. JAIN

The pottery from the third group is distinguished by the presence of the well-known Northern Black Polished Ware, which has been discussed in detail separately (below, pp. 50-52). Upon this Ware, which has been dated with some measure of precision,[1] depends the chronology of the lower levels of the site, since it provides a datum-line for the pottery of the earlier group. The associated industry is mainly a red ware occurring along with a thick grey ware of medium fabric. Analogues are quite frequent at sites of comparable date in the Gangā basin (below, p. 53).

The fourth group consists of pottery mostly of red ware. It is distinct alike from the preceding and the following groups and presents types and forms which are commonly met with at sites of the early Christian era, for example, the common bowl, lid with a central button-knob, bottle-necked sprinkler, etc. Noteworthy in this group is the black-on-red painted pottery similar to that recovered from Rangmahal and other sites in Bikaner.[2]

The last group comprises dull terracotta-red ware sometimes even without a wash. The fabric is distinctly absorbent. A notable feature of this group is the presence of the pre-Mughul glazed ware dealt with individually (below, pp. 71-73). Not much attention has so far been given to stratify properly this pottery, nor is there any workable analysis to fix its chronology independently. The only other site from which pottery of this class has been recovered from stratified digging is 'Ādilābād near Delhi, where it is securely dated to the first half of the fourteenth century.[3]

(ii) *Period I*

The lowest levels of Hastināpura, representing an average thickness of 1½ ft. immediately above the natural soil, yielded sherds of pale-red ware. The pottery, which is seemingly wheel-made, is distinctly under-fired and is treated with an ochre-wash in the nature of a slosh. The fabric ranges from coarse to medium and is readily distinguishable from that of other wares.

Not many sherds of this variety were found, and from their general look it appeared that they had 'rolled' about. Tiny fragments alone could be recovered from clods of otherwise clean clay. Up to date two more sites have yielded similar pottery: Rājpur Parsu in the Bijnor District and Bisaulī in the Badaun District, both in Uttar Pradesh. It is noteworthy that at both these sites copper hoards have also been recovered.

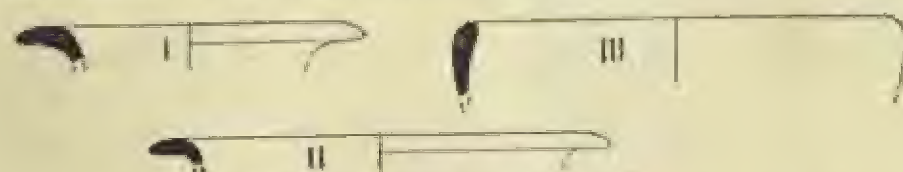


Fig. 5. *Pottery from Period I.* ¼

At Hastināpura, however, no copper was found in association with this pottery, which, nevertheless, belongs to a well-stratified sequence well preceding the Painted Grey Ware. This in itself adds a greater significance to the discovery elsewhere.

As already stated, the sherds are too fragmentary to give any shapes but allow comparison with similar pottery from other sites. Of the three types illustrated in fig 5 the first two have analogues at Rājpur Parsu.

[1] *Ancient India*, no. 1 (1946), pp. 55-58.

[2] Information from Shri A. Ghosh, who carried out exploration in the dried-up bed of the Sarasvati.

[3] *Ancient India*, *op. cit.*, pp. 72 ff.

Fig. 5

I. Fragment of a vase of pale-red ware with a flared rim. Of coarse fabric, it is treated with a wash.

II. Fragment of a vase of pale-red ware with a horizontally splayed-out rim. Of coarse medium fabric, it seems to be treated with a wash.

III. Fragment of a deep bowl with an incurved thickened rim. Of medium fabric, it is treated with a wash.

(iii) *Period II*

I. THE PAINTED GREY WARE.—This ware forms a homogeneous group belonging to a well-defined industry. It may in fact be used as a cultural label (above, p. 12). The distinctive features of this ware are the superior quality of the paste formed of well-levigated clay and fine thin well-burnt fabric achieved with an equally distributed heat in the kiln and agreeably smoothed grey surface. The fact that the ware is invariably thin in section renders the presence of a *dégraissant* unlikely since it will take away some of its plasticity. The fabric is so distinctive that it is the safest criterion to distinguish it from the cruder forms to which it degenerated later (below, pp. 52-53). The types represented are mainly straight-sided bowls, cups and dishes with incurved sides and sagger- or convex base (pls. XXV and XXVI B).[1] These are maintained throughout the occupation-period of this ware which represents nearly 7 ft. thick deposit.

On the grey surface of the body are painted linear and dotted patterns in black, executed before firing. The paint is mat. Instances of red-on-grey, black-on-black and bichrome[2] painted designs are also met with. The simplest and most elementary pattern is the single horizontal band which is seen repeated over and over again as a border for more complex patterns.

The commonest patterns are formed by groups of vertical or oblique strokes below the horizontal rim-band. The strokes are sometimes of unequal thickness and are thickened towards the end wherefrom the paint-brush started. These groups are sometimes interspersed with dots. Intersecting lines, rows of dots, dots and dashes or groups of wavy lines also appear on some of the pots. The individualistic designs include *svastikas*, concentric semicircles, sigmas, concentric circles with radiating rows of two lines each and hooks rising from a circle or from vertical lines. These designs are confined to the outside only. On the inner base of the dishes appear spirals, group of circles, intersecting chains, scalloped concentric circles, etc.

A careful study of the technique of the painting reveals that the outline of some of the designs was first drawn in a thin deep-black line, since where the paint has faded a thin black line is seen running along the whole pattern.

Associated and coeval with it is a brownish-red ware with a grey or buff core. The commonest shape in this ware is the dish-type resembling that of the Painted Grey Ware itself. The designs are executed in deep chocolate or black of an unequal tone on a yellow or pale-red ground. Sometimes the design is picked out in yellow or pale-red by painting or 'stopping' the remaining surface of the vase in black. There is, however, a complete agreement in the details of the painted design which normally consists of oblique strokes emerging from a horizontal rim-band.

The date of this ware has been discussed in sufficient detail (above, p. 23). Its importance has increased because of its wide distribution[3] and its stratigraphic position.

[1] A lid of this class of ware collected from surface has already been illustrated by B. B. Lal in *Jour. Roy. Asiatic Soc. Bengal* (Letters), N.S., XVI (1950) p. 94, fig. 1, 19.

[2] *Ibid.*, single fragment from surface, p. 95, fig. 2, 25.

[3] See below, pp. 138 ff., and fig. 1.



Painted and incised Grey Ware, Period II (*see page 33*)



A. *Base-fragment of N.B.P. Ware, painted in black pigment, Period III* (*see page* 52)



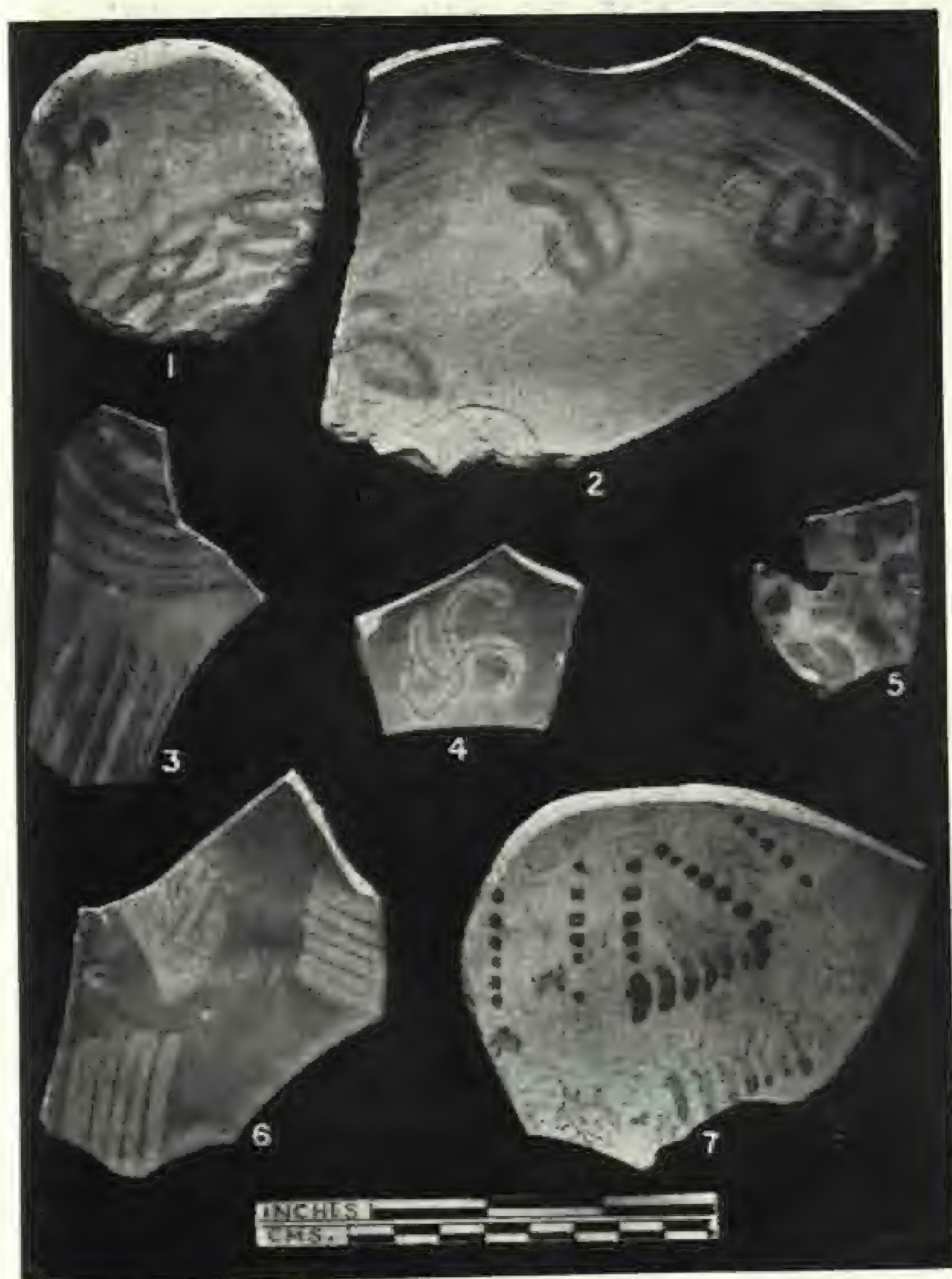
B. *Painted Grey Ware, Period II* (*see page* 33)



Painted Grey Ware, Period II [see pages 33 and 34]



Painted Grey Ware, Period II (see page 31)



Painted Grey Ware, Period II (see page 34)



B. *Corrugated stem of grey ware, Period II* (*see page 30*)



A. *Painted Grey Ware, Period II* (*see page 31*)

it being the only well-defined distinctive ceramic industry of the Dark Age. Outside India sherds of similar fabric are known in Thessaly[1] and Sistān.[2] Shāhī Tump in Baluchistan has also yielded a class of painted grey ware which is different from that of Hastināpura. The former is darkish grey in colour and is thinner in section, and what is more distinctive is the form and designs executed over it. On this ware there are no linear or dotted designs in the form in which they appear at Hastināpura. These are purely geometrical ones. Furthermore, the Shāhī Tump ware lacks the characteristic dish and the straight-sided bowl which are the guide-types of the Hastināpura Painted Grey Ware. Lastly, the former mostly shows a ring-base which is entirely absent at Hastināpura. There is, however, one point of agreement, and that is the small incised lines repeated on the base of some of the dishes at Hastināpura and on the sides of some of the bowls at Shāhī Tump. This bespeaks a common method of producing this effect.

The selected specimens have been illustrated both with photographs and line-drawings.

Pls. XXV and XXVI B—XXX A

Pls. XXV and XXVI B illustrate the principal types on which painted designs are normally executed.

1. Bowl of grey ware, painted in black on the outside with a panel consisting of groups of oblique wavy lines enclosing dots. Also fig. 6, 5.
2. Bowl of grey ware, painted in black on the outside with a group of oblique strokes thickened at one end.
3. Bowl of grey ware, painted in black on the outside with a horizontal rim-band over an indeterminate pattern. Also fig. 9, 46.
4. Bowl of grey ware, painted in black on the outside with a black slip below the shoulder and decorated with punched circles. Also fig. 9, 45.
5. Bowl of grey ware, painted in black on the outside with a horizontal rim-band above a group of roughly vertical lines. Also fig. 9, 49.
6. Dish of grey ware, painted in black on the outside with a group of oblique strokes having clubbed lower ends.
7. Bowl of red ware, painted in black on the outside with two long curved lines and five thickened strokes near the rim.
8. Basin of grey ware (red outside and grey inside) painted in black on the outside with a group of oblique strokes. Also fig. 8, 37.
9. Bowl of grey ware, painted in black on the inside with four groups of dots in rows converging in the centre. Also fig. 9, 52.

Pls. XXVII and XXVIII show the characteristic designs mainly on the outside and partly on the inside of the vase.

1. Bowl of grey ware, painted in black on the outside with an incomplete design formed by two lines enclosing dots repeated on three sides. Also fig. 6, 11.
2. Bowl-fragment of grey ware, painted in black on the outside with a horizontal rim-band above a design of disconnected loops formed by two lines enclosing rows of dots. Also fig. 6, 12.
3. Bowl-fragment of grey ware, painted in black on the outside with a horizontal rim-band above a group of six vertical strokes diametrical to five concentric semicircles.
4. Bowl-fragment of grey ware, painted in black on the outside with a group of five roughly vertical strokes. This is the simplest and the commonest design and is very often repeated both inside and outside below a horizontal rim-band. Also fig. 8, 32.
5. Bowl-fragment of grey ware, painted in black on the outside with a horizontal rim-band above a design formed by hooks emerging from two roughly vertical lines enclosing a zigzag one. Also fig. 6, 13.

[1] A. J. B. Wace and M. S. Thompson, *Prehistoric Thessaly* (Cambridge, 1912); see also pl. LXXIV A.

[2] Aurel Stein's collection in the Central Asian Antiquities Museum, New Delhi.

6. Dish-fragment of grey ware, painted in black on the outside with a thick horizontal band above a chequer-pattern. Also fig. 8, 30.

7. Bowl-fragment of grey ware, painted in black on the outside with a horizontal rim-band above an incomplete design showing merely a stroke with a pellet-end. Also fig. 6, 7.

8. Bowl-fragment of grey ware, painted in black with a design formed by three concentric circles with two radiating rows of two lines each enclosing dots. Also fig. 6, 15.

9. Bowl-fragment of grey ware, painted in black on the outside with a group of thick lines enclosing dots. Also fig. 10, 75.

10. Bowl-fragment of grey ware, painted in black on the outside with a horizontal rim-band above a design comprising two groups of semicircles separated by a medial groove. Also fig. 6, 8.

11. Bowl-fragment of grey ware, painted in black on the outside with a design formed by four hooks emerging from a common centre. Also fig. 6, 14.

12. Bowl-fragment of grey ware, painted in black on the outside with a design formed by two intersecting rows of two lines each enclosing dots. Also fig. 10, 76.

13. Dish-fragment of grey ware, painted in black on the outside with a design picked out by 'stopping' the remaining surface by a thin dark slip. Also fig. 8, 31.

14. Bowl-fragment of grey ware, painted in black on the inside with a flower-design picked out by 'stopping' the remaining surface by a thin dark slip. Also fig. 7, 21.

15. Dish-fragment of grey ware, painted in black on the inside with intersecting loops. Also fig. 8, 41.

16. Bowl-fragment of grey ware, painted in black on the inside with a horizontal rim-band above a group of dots in rows. Also fig. 7, 19.

Pls. XXIX and XXX A demonstrate the designs seen exclusively on the inner base of the vases.

1. Base-fragment of grey ware, painted in black on the inner side with a design formed by intersecting loops in chain-pattern. Also fig. 10, 65.

2. Base-fragment of grey ware, painted on the inner side with an indeterminable design.

3. Base-fragment of grey ware, painted in black on the inner side with a design formed by concentric circles and groups of lines approaching towards it.

4. Base-fragment of grey ware, painted on the inner side with a *swastika* design. Also fig. 10, 64.

5. Base-fragment of grey ware, painted in black on the inner side with a panel of sigmas in a circular pattern with an incomplete design.

6. Base-fragment of grey ware, the design comprising equidistant groups of strokes being 'picked out' in light grey by 'stopping' the remaining part of the surface with a thin dark slip. Also fig. 10, 63.

7. Base-fragment of grey ware, painted in black on the inner side with a design formed by rows of dots and dashes. Also fig. 9, 58.

8. Base-fragment of grey ware, painted in black on the inner side with a design formed by long hooks emerging from a circle and enclosing dots. Also fig. 9, 62.

9. Base-fragment of grey ware, painted in black on the inner side with a design formed by four groups of arcs converging to the centre. Also fig. 10, 72.

10. Base-fragment of grey ware, the design, imitating a 'rising sun', being 'picked out' in ash-grey by 'stopping' the rest of the body with a thin dark slip. Also fig. 10, 67.

11. Base-fragment of grey ware, painted in black on the inner side with groups of wavy lines. Also fig. 9, 60.

The drawn specimens are listed below. All the available forms have been included even at the risk of repetition of the designs described above.

Fig. 6-10

1. Bowl of grey ware with a vertical internally sharpened rim and straight sides. It is painted in black both on the outside and inside with a horizontal rim-band. From a late level of Period II.

2. Bowl of grey ware with a vertical internally sharpened rim and straight sides. It is painted in black on the inside with oblique lines below a horizontal rim-band and on the outside with a simple rim-band. From a mid-level of Period II.

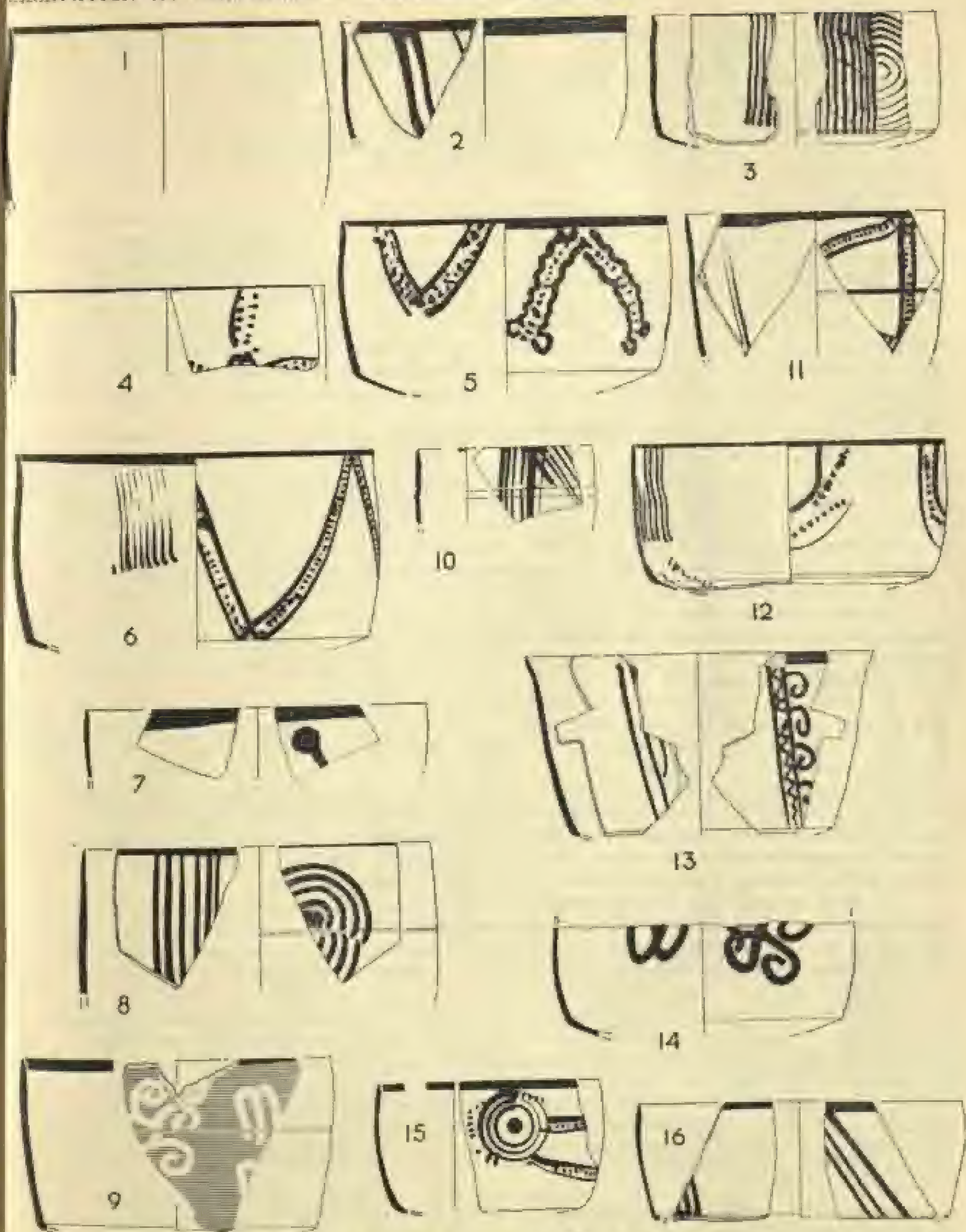


FIG. 6. *Pottery from Period II: Painted Grey Ware.* ½

3. Bowl of grey ware with a vertical internally sharpened rim and straight sides, grooved above their junction with the convex base. It is painted in black on the inside with a group of vertical strokes below a thin rim-band and on the outside with a group of vertical strokes interspersed with dots. Against the outermost stroke are seven concentric semicircles. From a mid-level of Period II.

4. Bowl of grey ware with a vertical internally sharpened rim and straight sides. It is painted on the inside with a simple rim-band and on the outside presumably with four leaves formed by arched strokes and a double line of dots shooting from a central circle. From an early level of Period II.

5. Bowl of grey ware with a vertical internally sharpened rim and straight sides carinated to a convex base. It is painted in black on the inside with a horizontal rim-band and two V-shaped rows each enclosing dots, converging towards the mid-portion of the body. On the outside the same pattern is repeated upside down below a thicker band, the strokes in this case being wavy. From a mid-level of Period II. Also pl. XXV, 1.

6. Bowl of grey ware with an everted internally sharpened rim and straight sides carinated to a convex base. It is painted on the inside with a thick horizontal rim-band and a group of roughly vertical strokes with thickened lower ends indicating that the brush moved from bottom upwards. On the outside is shown a thinner rim-band above a design of opposite triangles of two parallel lines enclosing dots.

7. Bowl of grey ware with a vertical internally sharpened rim. It is painted in black on the inside with a thick horizontal rim-band and on the outside with the same rim-band above a line ending in pellet. From a late level of Period II. Also pl. XXVII, 7.

8. Bowl of grey ware with a vertical progressively sharpened rim and straight sides grooved in the middle. It is painted in black on the inside with a group of vertical strokes below a horizontal rim-band and on the outside with a simple band above a design consisting of concentric semicircles separated by the mid-groove. From the accumulation following the erosion. Also pl. XXVIII, 10.

9. Bowl of grey ware with an internally sharpened rim and slightly tapering sides carinated to a presumably convex base. It is painted in black on the inside with a horizontal rim-band and on the outside with a simple rim-band above a design, consisting of hooks rising from a circle and an m-shaped pattern picked out in ash-grey by 'stopping' the rest of the body with a thin dark slip. From a mid-level of Period II.

10. Bowl of grey ware with a vertical internally sharpened rim, a mid-rib and straight sides. It is painted in black on the outside only with a group of vertical strokes of varying thickness starting from the rim where they are partially cut by another set of oblique strokes. From the accumulation following the erosion.

11. Bowl of grey ware with a vertical sharpened rim, a mid-groove and straight sides. It is painted in black on the inside with a thick horizontal rim-band and two roughly vertical strokes thinning towards the rim and on the outside with a horizontal rim-band above an incomplete design formed by groups of oblique as well as vertical rows of double lines, each enclosing dots. The mid-groove is also painted. From a mid-level of Period II. Also pl. XXVII, 1.

12. Bowl of grey ware with a vertical internally sharpened rim and straight sides carinated to a convex base. It is painted in black on the inside with a horizontal rim-band above a group of vertical strokes and a double row of dots and on the outside with a horizontal rim-band above a design of loops formed by two lines enclosing dots. From an early level of Period II. Also pl. XXVII, 2.

13. Bowl of grey ware with an out-turned sharpened rim and tapering sides carinated to a convex base. It is painted in black on the inside with roughly vertical strokes and on the outside with a horizontal rim-band above a design consisting of hooks emerging from a group of two vertical lines enclosing a zigzag one. From a late level of Period II. Also pl. XXVII, 5.

14. Lower part of a bowl of grey ware with roughly straight sides weakly carinated to a convex base. It is painted in black on the inside presumably with intersecting loops and on the outside with a design consisting of four hooks converging to a central point. From an early level of Period II. Also pl. XXVIII, 11.

15. Bowl of grey ware with a vertical internally sharpened rim and convex sides weakly carinated to a flattish base. It is painted in black on the inside with a horizontal rim-band and on the outside with a horizontal rim-band above a design consisting of two rows, each comprising two

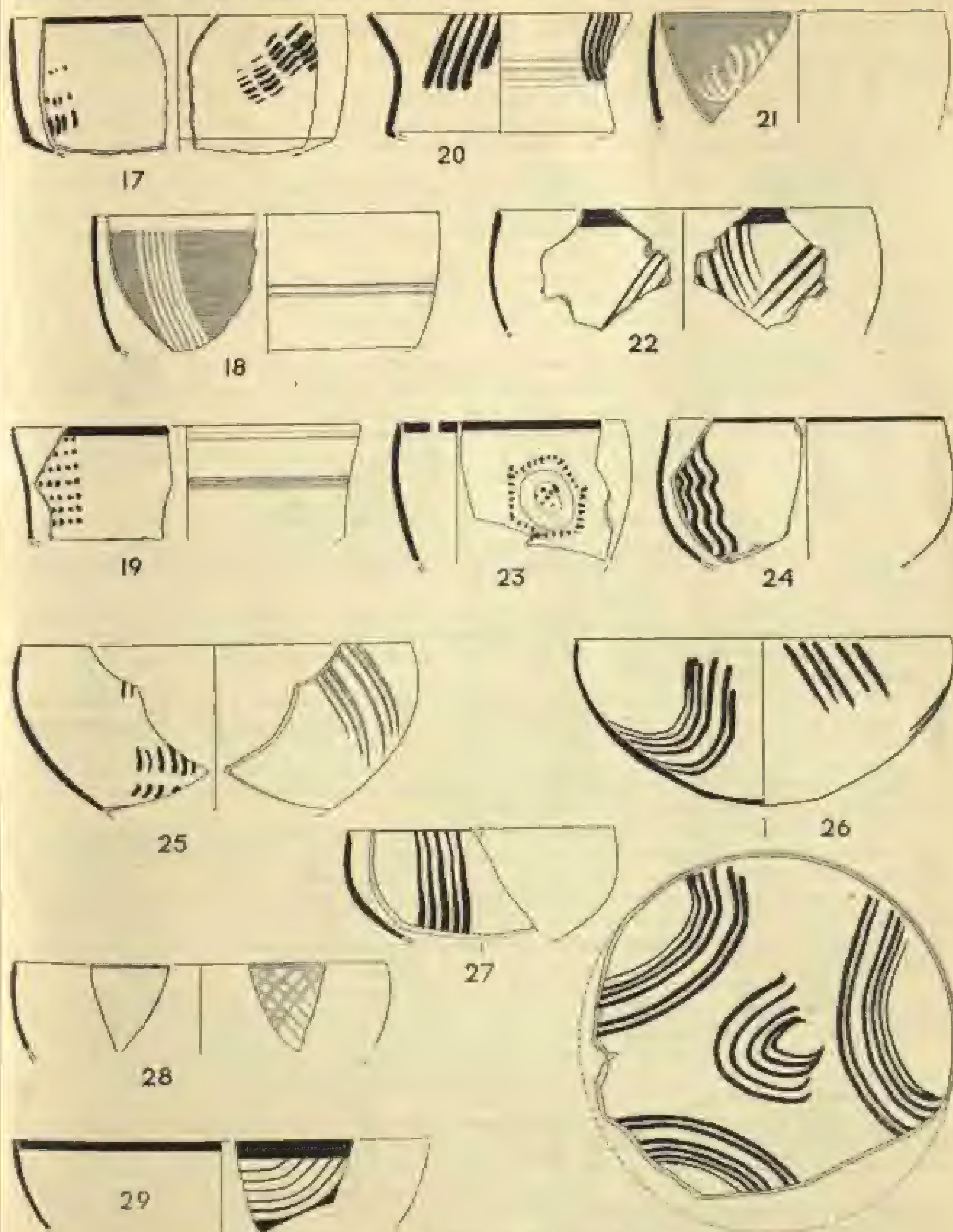


FIG. 7. *Pottery from Period II: Painted Grey Ware.* ¼

parallel lines enclosing dots, shooting from the outer periphery of concentric circles of unequal thickness bordered with dots. This incidentally reveals the starting point of the brush. From an early level of Period II. Also pl. XXVII, 8.

16. Bowl of grey ware with an inturned internally sharpened rim and slightly curved sides carinated to a convex base. It is painted in black on the inside with a horizontal rim-band above a group of oblique strokes and on the outside with the same design. From an unstratified deposit of Period II.

17. Bowl of grey ware with a vertical sharpened rim and slightly tapering sides carinated to a convex base. It is painted in black on the inside with a horizontal rim-band and a group of dots and dashes in one alignment and on the outside with grouped oblique dashes. From an unstratified deposit of Period II.

18. Bowl of grey ware with a featureless rim and roughly convex sides with two mid-grooves. On the inside the design consisting of a group of slightly curved lines is picked out in ash-grey by 'stopping' the rest of the body with a thin dark slip. The outside is plain. From an early level of Period II.

19. Bowl of grey ware with an inturned featureless rim and concave sides with three mid-grooves. It is painted in black on the inside with a horizontal thick rim-band above a group of dots of unequal size. The outside is plain. From a mid-level of Period II.

20. Bowl of red ware with a flared featureless rim and pronouncedly concave sides carinated towards the base. It is painted in black on the inside with a group of oblique strokes thickened towards the lower ends and on the outside with a group of roughly vertical strokes. From an early level of Period II.

21. Bowl of grey ware with a vertical internally sharpened rim and convex sides. On the inside the design, consisting of intersecting loops, is picked out in ash-grey by 'stopping' the rest of the body with a thin dark slip. The outside is plain. From an early level of Period II. Also pl. XXVIII, 14.

22. Bowl of red ware with an incurved internally thickened rim and convex sides. It is painted in black on the inside with a horizontal thick rim-band and oblique strokes and on the outside with two groups of oblique strokes starting from the horizontal rim-band in opposite direction. From an unstratified deposit of Period II.

23. Bowl of red-slipped ware with an incurved internally sharpened rim and convex sides. It is painted in black on the inside with a horizontal rim-band and on the outside with an irregular circle of dots enclosing roughly circular lines and dots. From a mid-level of Period II.

24. Bowl of grey ware with a vertical internally sharpened rim and convex sides. It is painted in black on the inside with a group of wavy lines below a thin rim-band; the outside has just a rim-band. From the accumulation following the erosion.

25. Bowl of grey ware (red outside and grey inside) with an incurved sharpened rim and convex sides. It is painted in black on the inside with grouped dashes and on the outside in brown thin paint with oblique strokes. From an early level of Period II.

26. Bowl of red ware with an internally bevelled rim, rounded sides and a flattish base. It is painted in black on the inside with three equally-spaced loops, each formed by six curved strokes, and one central loop of five strokes, and on the outside with oblique strokes. From an early level of Period II.

27. Bowl of grey ware with a vertical internally sharpened rim and rounded sides. It is painted in black on the inside with a horizontal thin rim-band above a group of five vertical strokes of unequal thickness. The outside is plain. From an early level of Period II.

28. Bowl of grey ware (red outside and grey inside) with an internally sharpened rim and incurved sides. It is painted in brown on the outside only with intersecting oblique strokes. From an early level of Period II.

29. Bowl of brownish red ware having grey core with a vertical internally sharpened rim and incurved sides. It is painted in black on the inside with a thick horizontal rim-band and on the outside with a thicker rim-band above looped strokes. From an early level of Period II.

30. Bowl of grey ware with a vertical sharpened rim and convex sides. It is painted in black on the inside with a thick horizontal rim-band and on the outside with a thicker rim-band above intersecting strokes. From a late level of Period II. Also pl. XXVII, 6.

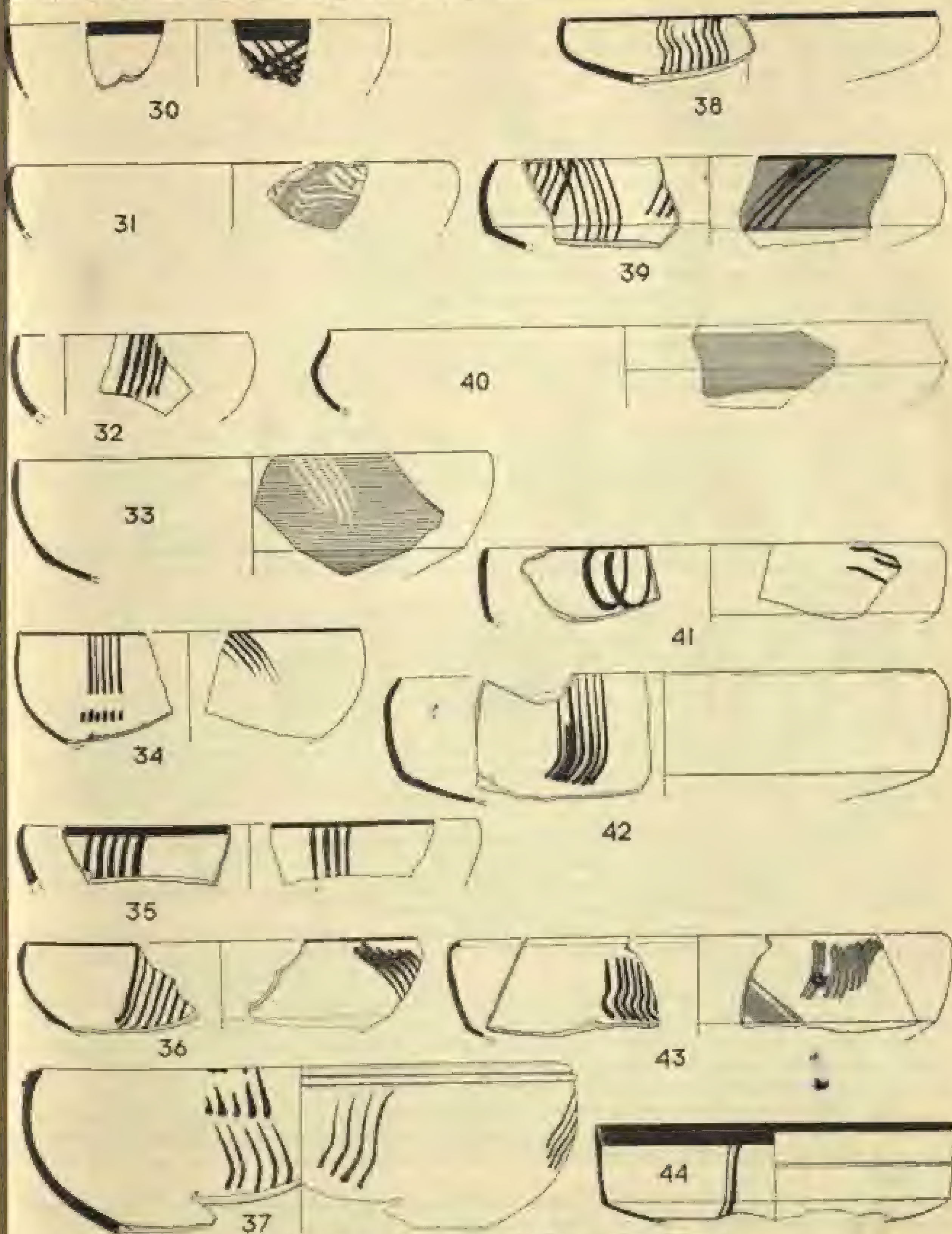


Fig. 8. *Pottery from Period II: Painted Grey Ware.* ½

31. Bowl of grey ware with a featureless incurved rim and convex sides. The design on the outside, consisting of horizontal spoon-shaped patterns and oblique lines partly cutting the former, is picked out in ash-grey by 'stopping' the rest of the body with a thin dark slip. The inside is plain. From an early level of Period II. Also pl. XXVIII, 13.

32. Bowl of grey ware with an incurved featureless rim and incurved sides. It is painted in black on the outside with oblique strokes starting from the rim and thickening towards the lower ends. From an early level of Period II. Also pl. XXVII, 4.

33. Bowl of grey ware with a vertical sharpened rim and incurved sides bluntly carinated to a sagger-base. The design on the outside, consisting of oblique lines starting from the rim, is picked out in ash-grey by 'stopping' the rest of the body with a thin dark slip. From an early level of Period II.

34. Bowl of grey ware with a vertical internally sharpened rim and rounded sides. It is painted in black on the inside with a thin horizontal rim-band above a group of five vertical strokes overlying a group of dashes and on the outside with a horizontal rim-band above a group of oblique strokes thinning towards the lower ends. From a late level of Period II.

35. Bowl of grey ware with an inturned featureless rim and thicker walls. It is painted in black on the inside with a horizontal rim-band above a group of five roughly vertical strokes. On the outside appears the same design but with four vertical strokes. From an early level of Period II.

36. Bowl of grey ware with an incurved sharpened rim and sides weakly carinated towards the base. It is painted in black on the inside with a horizontal rim-band above a group of oblique strokes and on the outside with a horizontal rim-band and a group of oblique strokes with thickened upper ends. From an early level of Period II.

37. Basin of grey ware with an externally grooved collared rim and rounded sides. It is painted in black on the inside with groups of disconnected oblique strokes and on the outside with groups of oblique strokes, the brush starting from bottom upwards. From an early level of Period II. Also pl. XXVI B, 8.

38. Dish of grey ware with a roughly vertical featureless rim and sagger-base. It is painted in black on the inside with a horizontal rim-band above a group of vertical wavy lines and on the outside with a mere rim-band. From an unstratified deposit of Period II.

39. Dish of grey ware with an inturned featureless rim and sides carinated to a sagger-base. It is painted in black on the inside with groups of oblique strokes, a few of which intersect near the rim, and on the outside with a horizontal rim-band and a group of four oblique strokes of unequal thickness. The design is executed over a thin film of black slip. From an early level of Period II.

40. Dish of grey ware with a short vertical internally sharpened rim and rounded sides with a weak mid-rib. It has a 'reserved' black slip on the outside. From the accumulation following the erosion.

41. Dish of grey ware with a vertical featureless rim and roughly straight sides weakly carinated towards the base. It is painted in black on the inside with a horizontal rim-band above two intersecting loops and on the outside with an indeterminate design of oblique strokes. From a mid-level of Period II. Also pl. XXVIII, 15.

42. Dish of grey ware with an inturned featureless rim and sides carinated to a sagger-base. It is painted in black on the inside with a group of six vertical strokes. The outside is plain. From a mid-level of Period II.

43. Dish of grey ware with a sharply inturned featureless rim and sides carinated to a sagger-base. It is painted in black on the inside with a group of ladle-shaped strokes and on the outside (which is partly oxidized) in thinner paint with a group of vertical strokes of varying thickness and length and another group of oblique strokes. It is a representative example of saggar-firing wherein the pots are stacked one above the other in the kiln. From an early level of Period II.

44. Dish of grey ware with a vertical internally sharpened rim and straight sides with a mid-groove carinated to a convex base. It is painted in black on the inside with two vertical lines below a thick rim-band and on the outside with a mere rim-band. From an early level of Period II.

45. Bowl of grey ware with a vertical featureless rim and a ledged shoulder. It is decorated on the outside with punched circles. From the accumulation following the erosion. Also pl. XXV, 4.

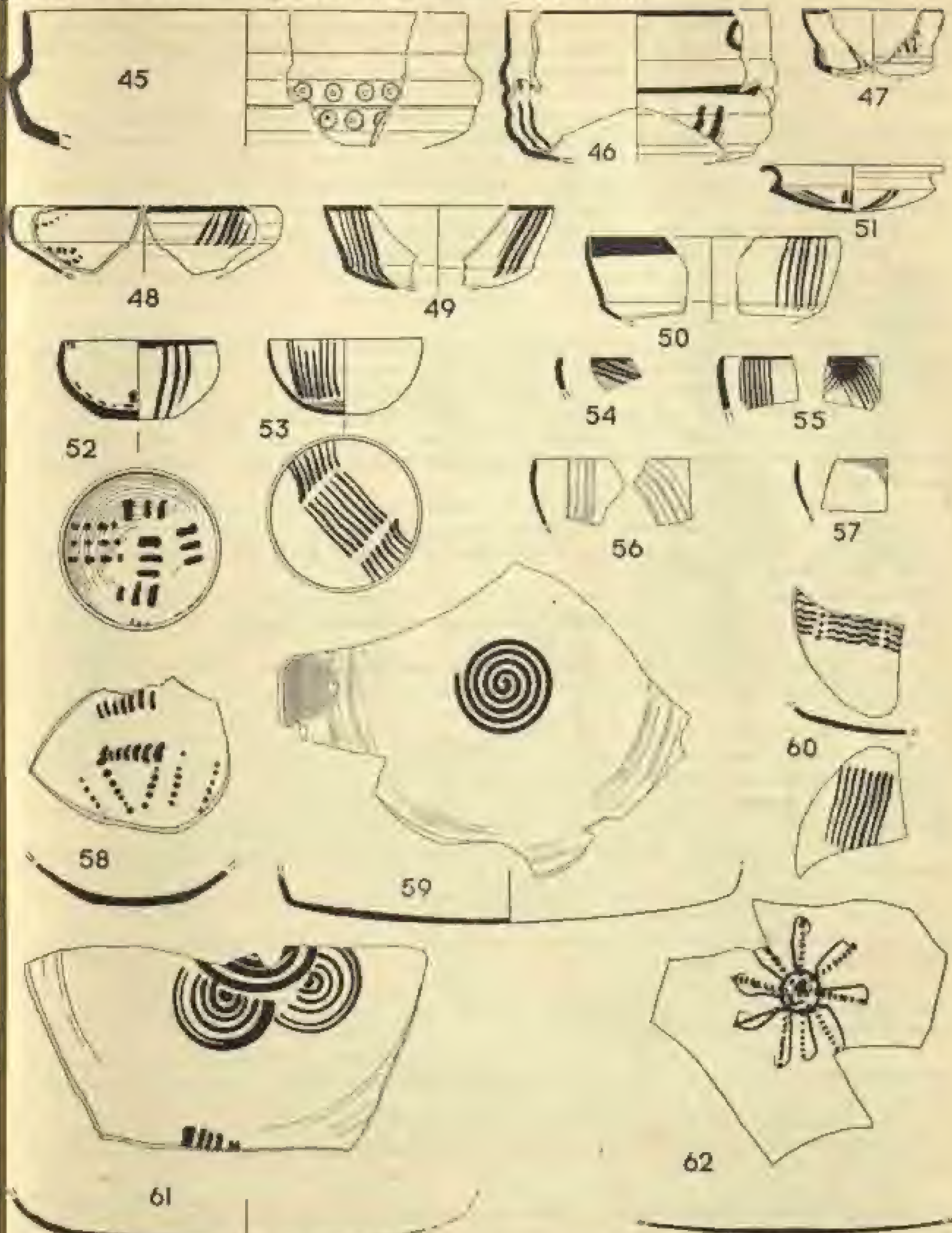


FIG. 9. *Pottery from Period II: Painted Grey Ware.* ¼

46. Bowl of grey ware with a vertical internally sharpened rim, corrugated sides and a flat base. It is painted in black on the inside with a group of two oblique strokes and a horizontal rim-band and on the outside with a horizontal rim-band, a mid-band and oblique strokes. From an early level of Period II. Also pl. XXV, 3.

47. Miniature bowl of grey ware with a featureless rim, concave sides with two grooves and a convex base. It is painted in black on the inside with a horizontal rim-band and oblique strokes and on the outside with a thin band and strokes. From a mid-level of Period II.

48. Bowl of grey ware with an inturned sharpened rim, incurved sides and a prominent sagger-base. It is painted in black on the inside with a group of dots below a horizontal rim-band and on the outside with a group of oblique strokes below the rim-band. From a mid-level of Period II.

49. Bowl of grey ware with a sharpened rim and tapering sides carinated to a sagger-base. It is painted in black on the inside with a horizontal rim-band above five vertical strokes and on the outside with a horizontal rim-band above four oblique strokes. From an unstratified deposit of Period II. Also pl. XXV, 5.

50. Bowl of grey ware with a vertical sharpened rim and tapering sides carinated to a sagger-base. It is painted in black on the inside with a thick horizontal rim-band and on the outside with a group of six vertical strokes. From an unstratified deposit of Period II.

51. Miniature vase of grey ware with a horizontally splayed-out rim and concave sides carinated to a rounded base. It is painted in black on the inside with oblique strokes on the base-portion and on the outside as well with oblique strokes on the underside. From an unstratified deposit of Period II.

52. Miniature bowl of grey ware with a vertical internally sharpened rim and a flat base. It is painted in black on the inside with four groups of dashes around a central one and on the outside with three vertical strokes below a horizontal rim-band. From an unstratified deposit of Period II. Also pl. XXVI B, 9.

53. Miniature bowl of grey ware with a vertical sharpened rim and a flattish base. It is painted in black on the inside only with three groups of diametrical strokes. The outside is plain. From a late level of Period II.

54. Rim-fragment of a bowl of grey ware, painted in black over a dark slip on the outside only with oblique strokes starting from a horizontal rim-band. From an unstratified deposit of Period II.

55. Rim-fragment of a bowl of grey ware, painted in black on the inside with a horizontal rim-band above a group of vertical strokes and on the outside with two groups of oblique strokes intersecting at the top. From an unstratified deposit of Period II.

56. Rim-fragment of a bowl of grey ware, painted in red on the inside with horizontal strokes and on the outside with oblique strokes. From an unstratified deposit of Period II.

57. Rim-fragment of a bowl of grey ware, painted in red on the outside only with a horizontal rim-band and oblique strokes. From an early level of Period II.

58. Base-fragment of a bowl of grey ware, painted in black on the inside with rows of dots and dashes. From an unstratified deposit of Period II. Also pl. XXIX, 7.

59. Base-fragment of a dish of grey ware, painted in black on the inside with a spiral design. From a late level of Period II.

60. Base-fragment of a dish of grey ware, painted in black on the inside with groups of wavy lines separated by rows of dots and on the underside with a group of eight strokes. From an early level of Period II. Also pl. XXX, 11.

61. Base-fragment of a dish of grey ware, painted in black on the inside with a design comprising groups of concentric circles bordering central concentric circles. A group of oblique strokes is also seen. From a late level of Period II.

62. Base-fragment of a dish of grey ware, painted in black on the inside with a design comprising long hooks and rows of dots shooting from a circle enclosing dots. From a mid-level of Period II. Also pl. XXX, 8.

63. Base-fragment of a dish of grey ware. The design, consisting of three groups of strokes pointing to a central group, is picked out in ash-grey by 'stopping' the rest of the body with a thin dark slip. From an early level of Period II. Also pl. XXIX, 6.

64. Fragment of a vase of grey ware, painted in black on the inside with a *svastika*. From [a]n unstratified deposit of Period II. Also pl. XXIX, 4.

65. Fragment of a vase of grey ware, painted in black on the inside with a design consisting of [tw]o rows of chains bordering a circle. In addition there is an incomplete design on the left. From [a] late level of Period II. Also pl. XXIX, 1.

66. Base-fragment of a dish of grey ware. The design, consisting of wavy lines and concen[tr]ic semicircles bordering another concentric circle, is picked out in ash-grey by 'stopping' the rest of [th]e body with a thin dark slip. From an early level of Period II.

67. Base-fragment of a dish of grey ware. The design, consisting of two rows of scalloped [pa]ttern imitating a 'rising sun' bordering concentric circles, is picked out in ash-grey by ['st]opping' the rest of the body with a thin dark slip. From the accumulation following the erosion. [Al]so pl. XXX, 10.



Fig. 10. *Pottery from Period II: Painted Grey Ware.* ½

68. Base-fragment of a dish of grey ware, painted in black with circular wavy lines. From an [u]nstratified deposit of Period II. Also pl. XXIX, 5.

69. Base-fragment of a vase of grey ware, painted in black with two intersecting loops and [f]our dots in a separate group. From an early level of Period II.

70. Base-fragment of a vase of grey ware, painted in black with a group of sigmas. From a [l]ate level of Period II.

71. Fragment of a bowl of grey ware, painted in black probably with a spiral design. From [a] late level of Period II.

72. Base-fragment of a dish of grey ware, painted in black with a design consisting of groups of arcs meeting in the centre. From an early level of Period II. Also pl. XXX, 9.

73. Base-fragment of a dish of grey ware. The design, consisting of intersecting loops forming a chain, is picked out in ash-grey by 'stopping' the rest of the body with a thin black slip. From the accumulation following the erosion.

74. Fragment of a vase of grey ware painted in black on the inside with an indeterminate pattern. From a mid-level of Period II.

75. Fragment of a vase of grey ware, painted in black on the inside with thin vertical lines and on the outside with thick vertical bands enclosing dots. From a late level of Period II. Also pl. XXVII, 9.

76. Bowl-fragment of grey ware, painted in black on the outside with a design formed by two intersecting rows of double lines each enclosing dots. The inside is again painted with a design of four intersecting loops enclosing two horizontal rows of four dots each. From a late level of Period II. Also pl. XXVIII, 12.

II. OTHER WARES.—The entire range of the plain ware from Period II is wheel-made. It comprises in the main three ceramic industries: (a) the red ware, (b) the polished black ware and (c) the grey ware.

A fair majority of the red ware is unslipped and the fabric, as a rule, is medium. Some of the pots are hand-made only to a modified degree since the rims thereof are invariably wheel-made. At the luting points beating marks are prominently seen. Husk and mica have been freely employed as *dégraissants*. On a few of such pots some sort of a black paint, carelessly executed, in the pattern of a thick band also appears on the rim and the shoulder (below, fig. 11, Ia). The commonest shapes are vases with out-turned rim, thickened externally. The latter also continue in the following Period in a variant form. The only decorations met with in this ware are a few impressed patterns.

In contradistinction to the above, the slipped ware in this variety has a consistently smooth paste and is also better burnt. Some of the types represented in this ware occur in grey ware as well (figs. 12 and 13, XXVI-XXVIII, XXX, XL, XLIV and XLV).

A notable industry requiring closer attention in this Period is the polished black ware, carefully turned on a fast wheel, treated with a smooth black slip and possibly also burnished (fig. 12, XXIX, XXXIII and XXXVII). Although dissimilar in fabric, finish and firing from the well-known Northern Black Polished Ware, its occurrence in the Painted Grey Ware strata does present a stage when people were experimenting with the production of polished black ware. Unlike the Northern Black Polished Ware, its body is pervious and does not bear so much of lustre. In this very variety a few pieces show 'inverted firing' technique resulting in black inside and black-and-red outside, the black confined to the rim (fig. 12, XXXIV). Similar sherds are also found at some of the sites in Bikaner which have yielded the Painted Grey Ware.[1]

Of the plain grey ware, the form and fabric are the same as those of the painted and need no repetition. Of particular interest in this ware, however, is a fragment of a stem with a corrugated profile (fig. 13, XLV; pl. XXX B). Roughly similar stems have been found at sites in western Asia, namely, Shah Tepe, etc.[2]

The following select types are illustrated:—

Figs. 11-13

Type I. Fragment of a vase of dull-red ware with a splayed-out rim, slightly thickened at mid-portion, and a carinated neck. Of medium fabric, it is treated with a wash. From a mid-level

[1] Information from Shri A. Ghosh.

[2] T. J. Arne, *Excavations at Shah Tepe, Iran* (Stockholm, 1945), pls. XLIV, 317-19, and XLVI, 328, 331, etc.

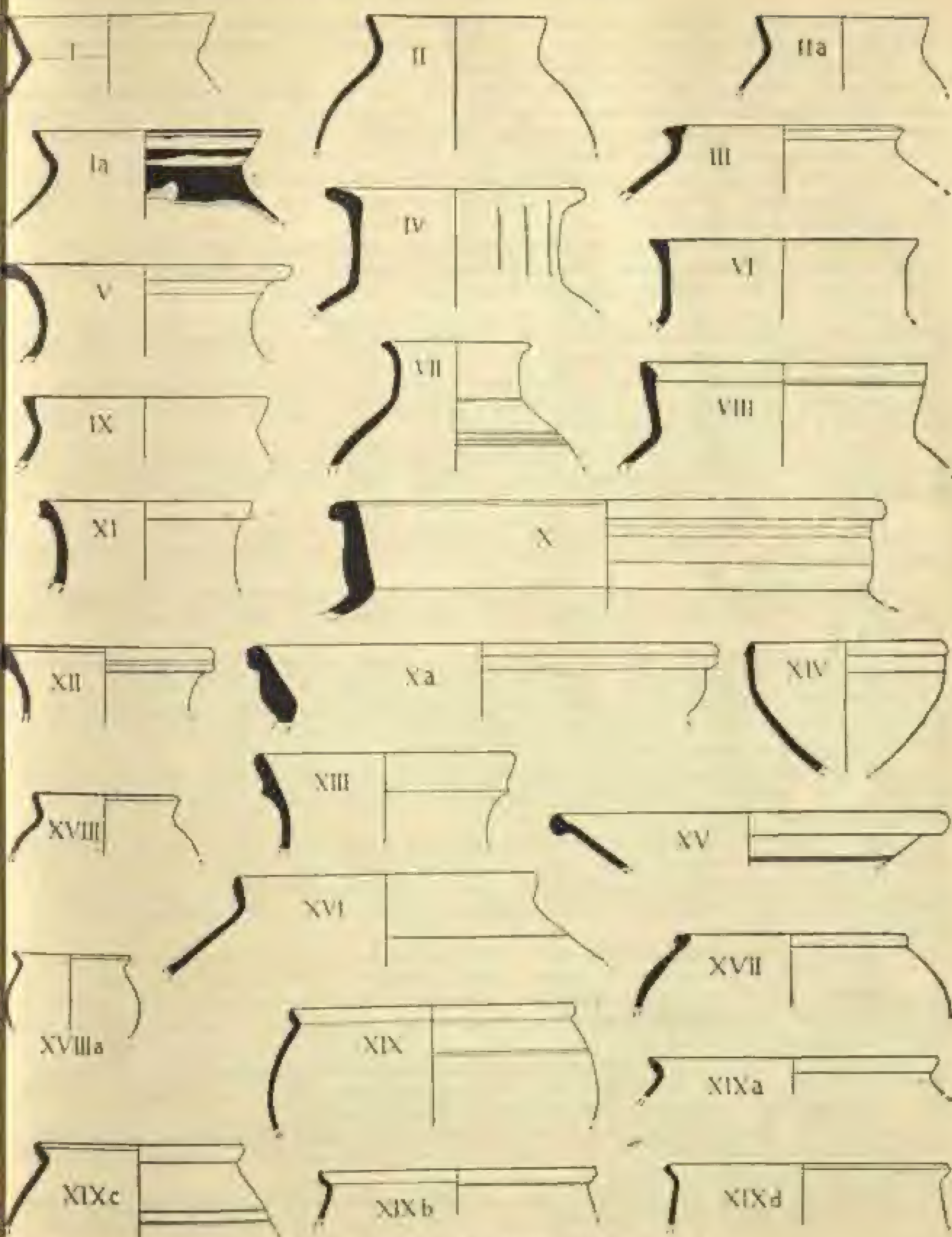


FIG. 11. *Pottery from Period II: other wares.* ¼

of Period II. *Variant Ia* differs from the above in having a less pronounced carination at the neck and a weak rib on the mid-portion of the rim. Of medium fabric, it is painted in black on the rim and the shoulder. From an early level of Period II.

Type II. Fragment of a vase of dull-red ware with an out-turned featureless rim and a concave neck. Of medium fabric, it is treated with a wash. From an early level of Period II. *Variant IIa* differs from the above in having a slightly more vertical rim. Of medium fabric, it is treated with a wash. From an early level of Period II.

Type III. Fragment of a vase of thick grey ware with a short vertical flat nail-head rim and a concave neck. Of medium fabric showing gritty section, it is devoid of any slip or wash. From a mid-level of Period II.

Type IV. Fragment of a vase of red ware with a vertical externally clubbed rim and a bluntly carinated neck. Of medium fabric, it is treated with a wash. It is distinguished by three vertical incisions on the neck. From a late level of Period II.

Type V. Fragment of a vase of dull-red ware with a flared externally thickened rim, weakly ribbed on the outside, and a concave neck. Of medium fabric showing husk in the paste, it is treated with a wash. From a mid-level of Period II.

Type VI. Fragment of a vase of drab ware with a vertical externally thickened rim, having slight depression on the otherwise flat top, and a long vertical concave neck. Of medium fabric, it is treated with a wash. From a mid-level of Period II.

Type VII. Fragment of a vase of red ware with an outcurved featureless rim, a vertical neck and a grooved shoulder. Of medium fabric, it is devoid of any slip or wash. From a late level of Period II.

Type VIII. Fragment of a vase of dull-red ware with a vertical internally thickened and obliquely cut rim. Of medium fabric, it is devoid of any slip or wash. From an accumulation following the erosion.

Type IX. Fragment of a vase of dull-red ware with an out-turned internally thickened rim and a bluntly carinated neck. Of medium fabric, it is treated with a wash. From an early level of Period II.

Type X. Fragment of a vase of red ware with an almost vertical clubbed rim, thickened near a carinated neck. Of coarse fabric, which has burnt black at places and shows husk in the paste, it is treated with a red slip on the outside. From an early level of Period II. *Variant Xa* differs from the above in having a splayed-out externally grooved rim. Of medium fabric, it is treated with a slip on the outside. From a late level of Period II.

Type XI. Fragment of a vase of dull-red ware with an outcurved thickened rim, externally grooved. Of medium fabric, it is devoid of any slip or wash. From an early level of Period II.

Type XII. Vase of dull-red ware with an out-turned externally grooved round-collared rim. Of medium fabric, it is treated with a wash. From a late level of Period II.

Type XIII. Fragment of a vase of red ware with a flared rim ridged on the outside. Of medium fabric, it is treated with a slip both externally and internally. From a mid-level of Period II.

Type XIV. Bowl of dull-red ware with a vertical externally thickened rim and a tapering body. Of medium fabric, it is treated with a wash. From a mid-level of Period II.

Type XV. Plate (?) of polished red ware with an out-turned nail-head rim and a double row of grooves on the body. Of fine fabric, it is treated with a red slip both externally and internally. From an early level of Period II.

Type XVI. Fragment of a vase of red ware with a vertical externally thickened rim and a bluntly carinated neck. It is distinguished by a groove on the shoulder. Of fine fabric, it is treated with a red slip on the exterior. From an early level of Period II.

Type XVII. Fragment of a vase of red ware with an externally thickened rim and a globular body which starts abruptly below the neck. Of fine fabric, it is treated with a red slip on the outside. From a late level of Period II.

Type XVIII. Fragment of a vase of red ware with an out-turned featureless rim and a concave shoulder. Of fine fabric, it is treated with a slip on the outside. From an early level of Period II.

Variant XVIIIa, of red ware, differs from the above in having thin walls and a splayed-out featureless rim. From the accumulation following the erosion.

Type XIX. Fragment of a vase of red ware with an everted, externally oval-collared rim, a carinated neck, a convex shoulder and a globular profile. It is distinguished by a groove on the shoulder. Of fine fabric, it is treated with a bright-red slip both externally and internally. From an early level of Period II. *Variant XIXa*, of greyish dark fabric, differs from the above in having a slightly sharpened rim. Of medium fabric, it is treated with a grey slip. From a late level of Period II. *Variant XIXb*, of red ware, differs from the main type in having a more pronounced everted rim. Of fine fabric, it is treated with a red slip. From an early level of Period II. *Variant XIXc*, of red ware, differs from the main type in having a prominently undercut rim inside and is also grooved on the body which is less spherical. Of fine fabric, it is treated with a red slip. From an early level of Period II. *Variant XIXd* differs from the main type in having a slightly thickened rim and straighter sides. Of fine fabric, it is treated with a red slip both externally and internally. From an early level of Period II.

Type XX. Fragment of a vase of bright-red ware with a horizontally splayed-out externally oval-collared rim presumably to afford an easy grip. Of fine fabric, it is treated with a bright red slip both externally and internally. The type is a rare one. From an early level of Period II.

Type XXI. Fragment of a vase of bright-red ware with a flared externally thickened rim. It is distinguished by a weak rib on the upper portion of the neck. Of fine fabric, it is treated with a fine red slip both externally and internally. From an early level of Period II.

Type XXII. Fragment of a vase of red ware with an outcurved round-collared rim. Of fine fabric, it is treated with a red slip both externally and internally. From a mid-level of Period II.

Type XXIII. Miniature bowl of red ware with a vertical thinning rim, straight sides and a rounded base. Of fine fabric, it is treated with a red slip both externally and internally. From a late level of Period II.

Type XXIV. Miniature vase of red ware, possibly hand-made, with an out-turned internally sharpened rim and a thick base. Of fine fabric, it is treated with a red slip. From a mid-level of Period II.

Type XXV. Dish of red ware with an inturned internally bevelled rim and a blunt carination at the base. Of fine fabric, it is devoid of any slip or wash. From an early level of Period II. *Variant XXVa* differs from the above in having a slightly externally chamfered rim. Of fine fabric it is treated with a red slip both externally and internally and has a burnished surface. From an early level of Period II. *Variant XXVb* differs from the main type in having a slightly sharpened rim. Of fine fabric, it is treated with a red slip both externally and internally. From an early level of Period II. *Variant XXVc* differs from the main type in being sharply carinated at the base. Of fine fabric, it is treated with a red slip both externally and internally. From an early level of Period II. *Variant XXVd*, of red ware, differs from the main type in having a vertical featureless rim and a sagger-base. Of fine fabric, it is treated with a red slip both externally and internally. From a mid-level of Period II. *Variant XXVe* differs from the main type in having an externally collared rim. Of fine fabric, it is treated with a bright-red slip both externally and internally. From an early level of Period II. *Variant XXVf* differs from the main type in having a vertical sharpened rim and a convex base. Of fine fabric, it is treated with a red slip both externally and internally. From an early level of Period II.

Type XXVI. Dish of grey ware with a vertical featureless rim, straight sides and a carination at the base. Of fine fabric, it is treated with a dark grey slip both externally and internally. From the accumulation following the erosion. *Variant XXVIa* differs from the above in having tapering sides and a prominent sagger-base. Of fine fabric, it is treated with a dark slip both externally and internally. From a mid-level of Period II.

Type XXVII. Dish of grey ware with a closing featureless rim and a rounded base. Of medium fabric, which shows mica, it is treated possibly with a wash. From an early level of Period II.

Type XXVIII. Dish of distinctive grey ware with an incurved featureless rim, incurved sides and presumably a flat base. Of fine fabric, it is treated with a grey wash. From a mid-level of Period II.

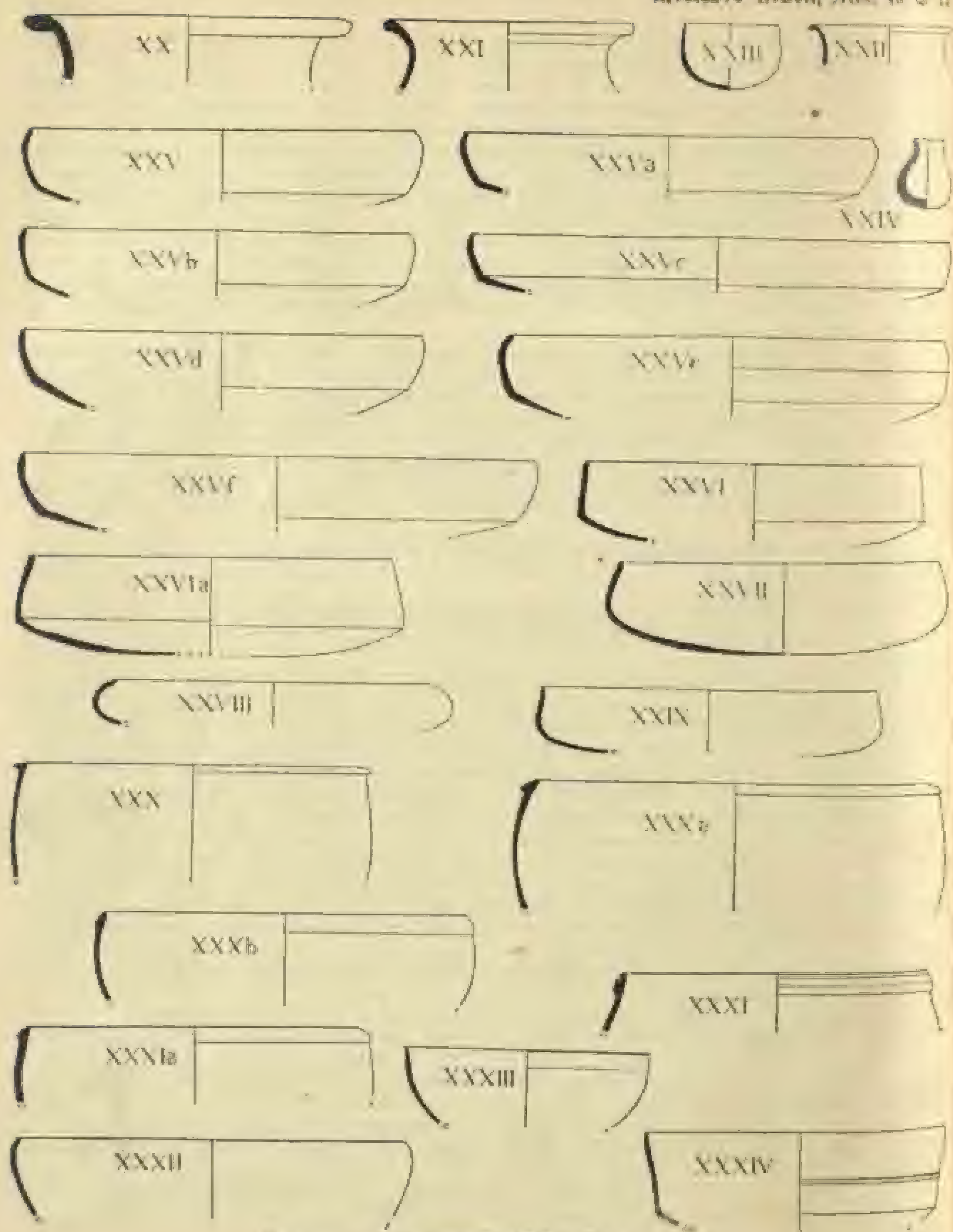


FIG. 12. *Pottery from Period II: other wares.* ¼

Type XXIX. Dish of black ware with a vertical internally sharpened rim; it is weakly carinated) an imperfectly flat base. Of fine fabric, it is treated with a smooth red slip and is also burnished. t is noteworthy that it is not fired at such a high degree of temperature as the N.B.P. Ware, which ecomes almost impervious and gives a lustre. From an early level of Period II.

Type XXX. Deep bowl of grey ware with a slightly inturned externally clubbed rim. Of istinctive grey fabric, it is treated with a light slip both externally and internally. From a late evel of Period II. *Variant XXXa*, of bright-red ware, differs from the above in having an oblique lubbed rim. Of fine fabric, it is treated with a bright-red slip both externally and internally. From late level of Period II. *Variant XXXb*, of red ware, differs from the main type in having a collared im and less deep sides. Of fine fabric, it is treated with a red slip both externally and internally. rom a mid-level of Period II.

Type XXXI. Fragment of a basin of red ware with an externally elliptical-collared and grooved im. Of fine fabric, it is treated with a red slip both externally and internally. From an early level of eriod II. The type occurs with slight variation in grey ware as well, wherein it is also painted (cf. g. 8, 37). *Variant XXXIa* differs from the main type in having an externally collared rim. Of nedium fabric, it is devoid of any slip or wash. From a mid-level of Period II.

Type XXXII. Deep bowl of red ware with an incurved featureless rim. Of medium fabric, is treated with a red slip both externally and internally. From a mid-level of Period II.

Type XXXIII. Bowl of polished black ware with a vertical internally sharpened rim. Of fine abric, it is treated with a black slip both externally and internally and has a burnished smooth urface. From an early level of Period II.

Type XXXIV. Bowl of black-and-red ware with a vertical sharpened rim, grooves on the outer body and a carination towards the base. Of fine fabric, it is treated with a slip both xternally and internally and has been subjected to inverted firing. From an early level of

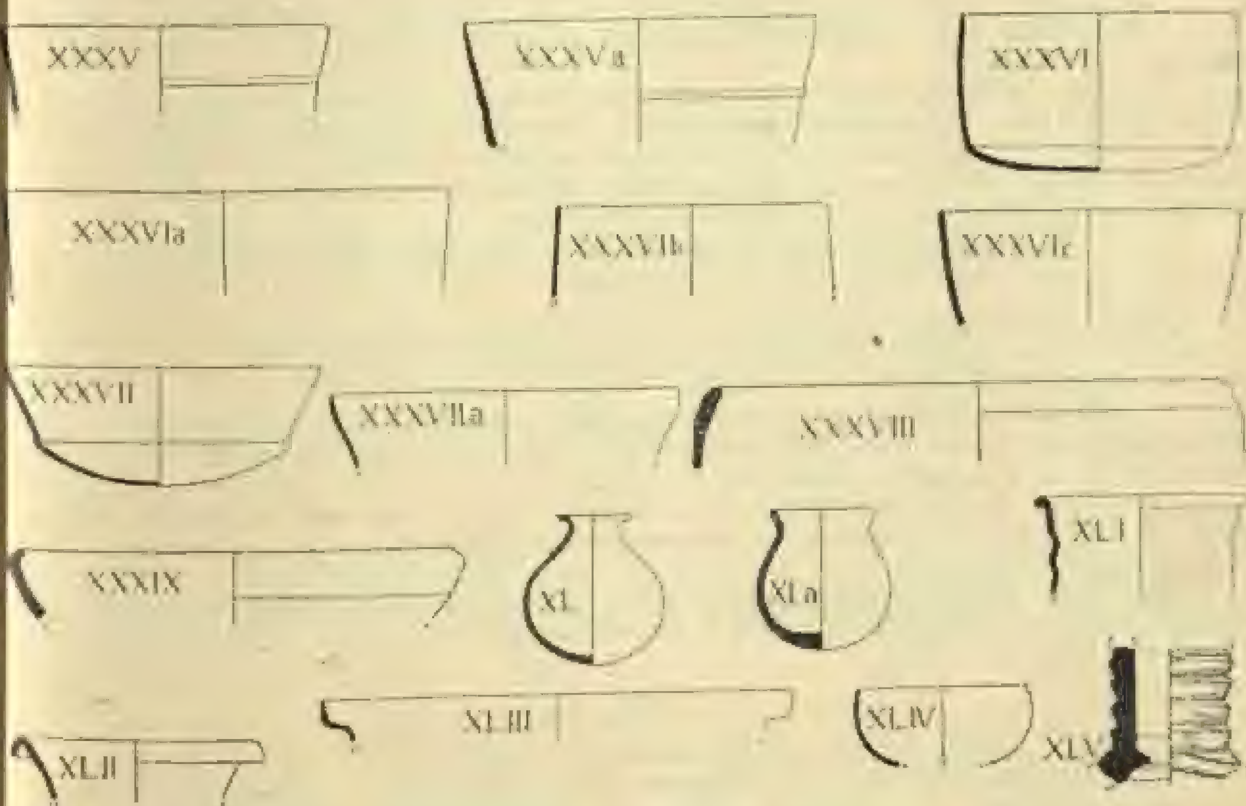


FIG. 13. *Pottery from Period II: other wares.* ¼

Period II. Similar sherds have also been recovered from some of the sites in Bikaner where Painted Grey Ware is also found.[1]

Type XXXV. Fragment of a bowl of black ware with a vertical featureless rim; it is distinguished by grooves on the body. Of fine fabric, it is treated with a red slip. From an early level of Period II. *Variant XXXVa*, of red ware, differs from the above in having a bold rib on the body. Of fine fabric, it is treated with a red slip both externally and internally. From a mid-level of Period II.

Type XXXVI. Bowl of fine grey ware with a vertical internally sharpened rim, straight sides and a convex base. Of fine fabric, it is treated with a smooth slip both externally and internally. From a late level of Period II. *Variant XXXVIa*, of red ware, differs from the above in having a slightly everted featureless rim. Of fine fabric and thin section, it is treated with a red slip both externally and internally. From an early level of Period II. *Variant XXXVIb* differs from the main type in having a featureless rim. Of fine fabric, it is treated with a red slip both externally and internally. From the accumulation following the erosion. *Variant XXXVIc* differs from the above in having a tapering body. Of fine fabric, it is devoid of any wash or slip. From a mid-level of Period II.

Type XXXVII. Bowl of polished black ware with a sharpened rim, an expanding mouth and a carination towards the base which is convex in shape. Of fine fabric, it is treated with a slip both externally and internally. From an early level of Period II. *Variant XXXVIIa*, of black-and-red ware, differs from the above in having an incurved sharpened rim. Of fine fabric, it is treated with a slip which has burnt black inside and black-and-red outside, the black confined to the rim-portion. From an early level of Period II.

Type XXXVIII. Fragment of a basin of grey ware with an incurved featureless rim, weakly cordoned on the exterior. Of medium fabric, it is treated with a wash. From a late level of Period II.

Type XXXIX. Fragment of a basin of bright-red ware with an inturned externally thickened rim. Of fine fabric, it is treated with a bright-red slip both externally and internally. From an early level of Period II.

Type XL. Miniature vase of grey ware with a horizontally splayed-out rim, a concave neck and a rounded base. Of distinctive grey fabric, it is treated with a slip both externally and internally. From a mid-level of Period II. *Variant XLa*, of grey ware, differs from the above in having an out-turned featureless rim and a thicker base. Of fine fabric, it is treated with a slip both externally and internally. From a mid-level of Period II.

Type XLI. Fragment of a vase of distinctive grey ware with a drooping featureless rim and corrugated sides. Of fine fabric, it is treated with a slip on the outside only. . From a mid-level of Period II.

Type XLII. Fragment of a vase of grey ware with a pronounced externally drooping featureless rim. Of fine fabric, it is treated with a slip both externally and internally. From the accumulation following the erosion.

Type XLIII. Fragment of a vase of fine grey ware with a short vertical sharpened rim and a horizontally splayed-out concave neck. Of fine fabric, it is treated with a slip both externally and internally. From a late level of Period II.

Type XLIV. Bowl of grey ware with a vertical sharpened rim and straight sides rounded towards a flattish base. Of fine fabric, it is treated with a slip both externally and internally. From an early level of Period II.

Type XLV. Fragment of the stem of a vase of grey ware with a corrugated profile. Of medium fabric, it is treated with a darkish grey slip on the outside only. From an early level of Period II. Also pl. XXX B.

(iv) *Period III*

1. The Northern Black Polished Ware.—This ware, invariably potted on a fast wheel, is usually thin and has a strikingly polished surface having almost a lustrous

[1] See above, p. 44, n. 1.

metallic finish and ranges in colour from coal-black through steel-grey or silvery to golden. The exterior surface of some of the pots shows patches of reddish brown or sepia. In the same fabric deep-red and chocolate colours are also achieved. The paste is consistently fine and well-levigated and contains very little of tempering material. The core is usually grey but tends to be reddish in some cases wherein below the thin film of shining black a mat-red surface is seen.

The distinctive glossy brilliance of this ware has raised obvious enquiries as to the method of its manufacture. From the published report of the Archaeological Chemist,[1] it appears that after being turned on the wheel, the pots were 'wet-smoothed' and burnished to increase the compactness and impermeability of the pots and thereafter dressed with a highly ferruginous clay, the lustre being achieved by the incipient fusion of the slip in the process of firing itself. It is quite possible that the smooth lustre may have been the result of the employment as a finish of a clay-solution in which the size of the constituent particles is reduced by peptisation. Some tarry material resulting from firing may have further contributed to produce the shining polish. The frequent peeling of the slip in this ware suggests that the pots may have been fired more than once, although this point needs closer analysis.[2] Decorations include stamped rosette or concentric raised bands or dots in a circle with spokes.

The shapes met with in this ware are very simple: (a) dishes with incurved or straight sides; (b) bowls with straight, convex, corrugated or tapering sides; (c) lids with flat terminals; and (d) sharply carinated *hāṇḍīs*.

The ware has quite a wide distribution ranging from Nāsik in the west to Bāngarh in the east.[3] Although confined principally to northern India, it penetrated as far south as Śiśupālgarh in Orissa. The remarkable uniformity in technique and appearance of this ware throughout does suggest a common centre of origin. It is observed that at the sites located in the Gangā plain it is more abundant and, in fact, outnumbers the other local ware in the main strata of its occurrence. Some of the sites in this belt are, therefore, likely to give a clue to the place of manufacture of this typical pottery.

Regarding its date, the Taxila evidence reveals that the ware was in popular use and demand essentially before the fourth century B.C. (above, p. 23). Subsequent work at Kauśāmbī, Vaiśālī and Hastināpura has thrown more light in this direction.

During the two seasons' work at Hastināpura, as many as one hundred and one sherds were recovered. All of these came from Period III: a majority, however, was confined to the lower levels. Punch-marked coins which range, in the main, between the fifth and second century B.C. were also found in association with these sherds, a few of which were also recorded below the lowest occurrence of punch-marked coins. The industry, therefore, preceded the usage of punch-marked coins here. In Period IV in which Mathurā coins of *circa* second century B.C. occur in the lower levels, the ware is entirely absent. It follows, therefore, that the industry had ceased at Hastināpura by the second century B.C. The evidence at Kauśāmbī is consistent with this dating. Here the top levels of the N.B.P. Ware-bearing deposits also yielded uninscribed cast coins of *circa* third century B.C., and below that is a clear deposit of nearly 8 ft. yielding this class of pottery.[4]

[1] *Ancient India*, no. 1 (1946), p. 58.

[2] It will be of interest to know that the Athenian vases are successively fired under oxidizing, reducing and re-oxidizing conditions to achieve the 'glaze'. G. M. A. Richter in *Jour. British School at Athens*, XLVI (1951), pp. 143-50.

[3] See fig. 1 and below, pp. 143 ff.

[4] Information from Shri G. R. Sharma, Allahabad University.

The revised date of the N.B.P. Ware may, therefore, be taken as early sixth century B.C. to early second century B.C.

Of the sherds recovered from Hastināpura, the following afford determinable shapes:—

Fig. 14

1. Bowl of N.B.P. Ware with a vertical sharpened rim and thin walls. The exterior surface shows patches of brown. From an early level of Period III.

2. Dish of N.B.P. Ware with a vertical internally thickened and pointed rim. From an early level of Period III.

3. Bowl of N.B.P. Ware, steel-grey in colour, with an out-turned featureless rim; it is bluntly carinated to a rounded base. From a mid-level of Period III.

4. Dish of N.B.P. Ware with a vertical sharpened rim and slightly incurved sides. From an early level of Period III.

5. Bowl of N.B.P. Ware with a featureless rim, progressively widening sides and a carination above the convex base. Unstratified.

6. Fragment of a vase of N.B.P. Ware, golden in colour, with a footed base. From an early level of Period III.

7. Lower portion of a vase of N.B.P. Ware with a convex base. It is painted on the outside in black pigment with a curvilinear pattern executed possibly after firing since the design-portion, which is in black, overlies the lustrous surface. Also pl. XXVI A. From an early level of Period III.

8. Fragment of a lid of N.B.P. Ware, golden in colour, with a flat terminal. Unstratified.

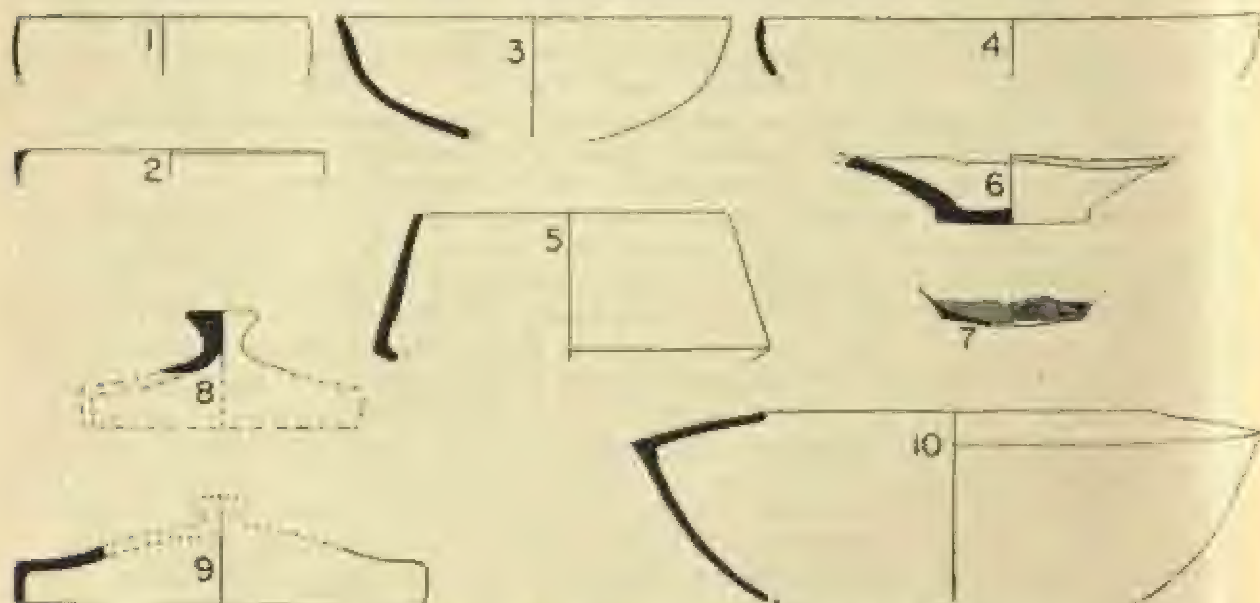


FIG. 14. *Pottery from Period III: Northern Black Polished Ware.* ¼

9. Fragment of a lid of N.B.P. Ware with a vertical featureless rim-base and a flat (reconstructed) terminal. From an early level of Period III.

10. Vase of N.B.P. Ware with an almost horizontally closing featureless rim, it is sharply carinated to a rounded base which is thinner in section and is marked by the presence of soot. From a mid-level of Period III. The type occurs both in thick grey and red ware and is available at Kauśāmbī, Ahichchhatrā, Vaiśālī, Jhūsī, Lachchhāgiri, Bhīṭā and Bhir Mound, Taxila.

II. OTHER WARES.—The plainer wares associated with the Northern Black Polished Ware include: (a) the thick grey ware and (b) the red ware. Let it be stated

at the outset that there is no similarity of fabric and colour between this grey ware and that found in Period II. This ware is thicker in section, has a grey gritty core and blackish surface and is not fired at such a high degree of temperature as the latter. The vessels are mostly plain; some of the sherds also show some painted designs which, though very simple indeed, are executed with far less care if at all they were intended to be so. Sometimes they look meaningless since the black slip having trickled at places gives the impression of a design. Similar painted sherds were also recovered from the lower levels of Kauśāmbī which also yielded the N.B.P. Ware. In any case the ware, as a class, is debased and crude. The principal types met with are: (a) dishes (figs. 15 and 16, XV, XVI and XVIII); (b) basins with collared rim and sometimes 'lipped' (figs. 16 and 17, XXII-XXV); (c) bowls with internally bevelled rim (fig. 15, II); (d) basins with highly thickened shoulders; and (e) carinated *hāṇḍīs* of the type met with in N.B.P. Ware (fig. 19, LI). Decorations comprise applied rope or notched pattern usually done immediately below the rim on the outside of the basins (fig. 17, XXV).

Noteworthy exceptions to this class of grey ware are the dishes of fine-grained grey fabric and slipped smooth surface. On the inner side of the base of these are impressed designs showing raised concentric bands or grooves or conventionalized rosettes (cf. fig. 16, XVIII). Similar designs appear on some of the dishes from Pāṭaliputra displayed in the Patna Museum, Vaiśālī and Bhīr Mound, Taxila. It is worth mentioning here that this fabric also does not correspond to that of the Painted Grey Ware which is distinctively thinner in section, less compact and lighter in colour approaching more towards ash-grey. Some of the N.B.P. Ware sherds at Kauśāmbī also show these impressed patterns. This further brings this 'grey ware' closer to the N.B.P. Ware.

The red ware is mostly unslipped and of medium fabric. The paste contains a good deal of mica. Firing is uniformly good. The characteristic types of this ware are: (a) miniature bowls (fig. 15, I); (b) pear-shaped vases (fig. 18, XXXI); (c) lids (fig. 15, VIII); (d) basins with nail-head rim sometimes with lug- or loop-handle (fig. 16, XX and XXI); and (e) carinated *hāṇḍīs*. Another distinctive type is the flat lid with strap-handle or nail-head knob for lifting (fig. 19, LIII). The type has analogues at Ahichchhatrā.[1]

Almost all of these types occur at Rājgīr, Pāṭaliputra, Vaiśālī, Kauśāmbī, Lachchhāgiri, Bhīṭā, Jhūsī, Ahichchhatrā, and, to some extent, at Bhīr Mound, Taxila. Furthermore, at all these places they are found in association with the N.B.P. Ware.

The only decorations met with in the red ware are a design imitating linen or basket and another showing triangular or circular notches on the rim-tops of the basins (fig. 16, XXI).

The following select types are illustrated:—

Fig. 15-19

Type I. Bowl of dull-red ware with a vertical featureless rim and a flat base. Of fine fabric, it is devoid of any slip or wash. From an early level of Period III. The type is also known at Kauśāmbī and Vaiśālī in levels yielding the N.B.P. Ware. *Variant Ia* differs from the above in having a sharpened rim. Of fine fabric, it is devoid of any slip or wash. From an early level of Period III.

Type II. Bowl of grey ware with a slightly everted internally bevelled rim. Of medium fabric, it seems to have been given a thin black slip on the exterior only. From an early level of Period III. It is a characteristic type of this Period and is found at Vaiśālī and Kauśāmbī also. *Variant IIa* differs from the main type in having a slightly thickened rim. Of medium fabric, it is treated with a wash only. From a mid-level of Period III.

[1] *Ancient India*, no. 1 (1946), p. 42, fig. 1, 16.

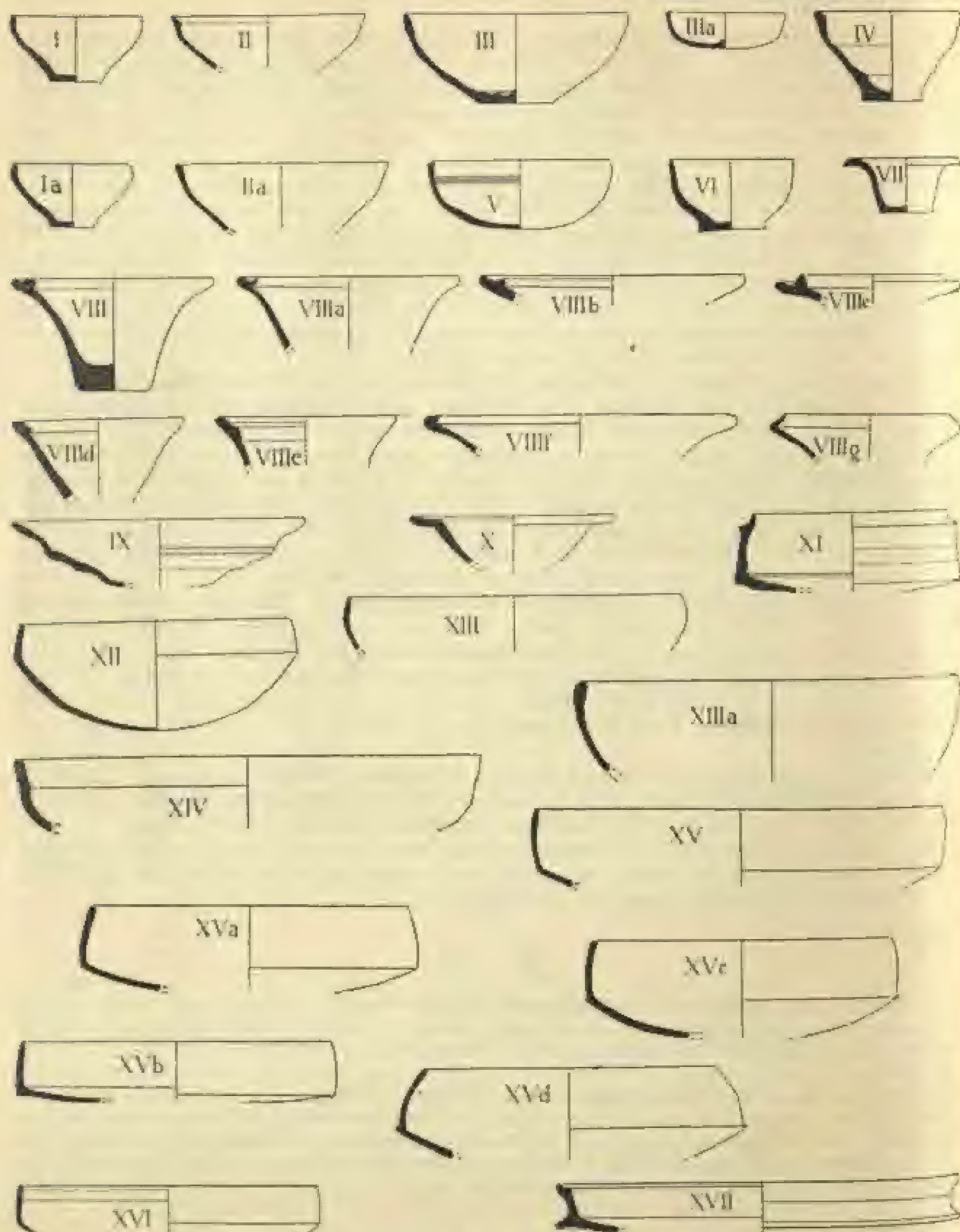


FIG. 15. *Pottery from Period III: other wares.* ¼

Type III. Bowl of darkish grey ware with a vertical slightly thickened rim and a flat base which is distinguished on the inner side by a central knob within a raised circle. Of medium fabric, it is treated with a slip both externally and internally. From an early level of Period III. *Variant IIIa*, of grey ware, differs from the above in having a vertical featureless rim. Of the same fabric as above, it is treated with a wash. From a dump of Period III.

Type IV. Bowl of dull-red ware with a vertical internally bevelled rim and a flat base. It is further distinguished by having internally corrugated sides. Of medium fabric, it is treated with a wash. From an early level of Period III.

Type V. Bowl of grey ware with a vertical featureless rim and a flattened base. Of medium fabric, it is treated with a thin slip. From a mid-level of Period III.

Type VI. Bowl of grey ware with a vertical sharpened rim and a flat base. Of coarse fabric, it is devoid of any slip or wash. From a mid-level of Period III.

Type VII. Bowl of fine grey ware with a horizontally splayed-out rim and a flat base. Of comparatively fine fabric, it is devoid of any slip or wash. From the earliest level of Period III.

Type VIII. Bowl-*cum*-lid of red ware with a folded rim, internally undercut, and a flat base. Of medium fabric, it is treated with a wash. From a mid-level of Period III. *Variant VIIIa* differs from the main type in having a sharpened vertical lip. Of fine fabric, it is treated with a wash. From an early level of Period III. *Variant VIIIb* differs from the main type in having a rebated lip. Of medium fabric, it is treated with a wash. From a mid-level of Period III. *Variant VIIIc* has a prominent lip and a flanged waist. It is this type which develops itself into the popular lid during later periods. Of medium fabric, it is treated with a wash. From an early level of Period III. *Variant VIIId*, of red ware, differs from the main type in having an internally oval-collared and undercut rim. Of medium fabric, it is treated with a wash. From a mid-level of Period III. *Variant VIIIe* differs from the above in having an internally thickened and grooved rim. Of medium fabric, it is treated with a wash. From a mid-level of Period III. *Variant VIIIf*, of grey ware, differs from the main type in having an internally round-collared undercut rim. Of medium fabric, it is treated with a wash. From a mid-level of Period III. *Variant VIIIg*, of red ware, differs from the main type in having a closing rim. Of fine fabric, it is devoid of any slip or wash. From surface-collection.

Type IX. Bowl of darkish grey ware with a flared featureless rim and a wavy profile having two grooves in mid-portion. Of finer fabric, it is treated with a black slip on the outside. From a late level of Period III.

Type X. Bowl of red ware with a horizontally splayed-out concave rim. Of fine fabric, it is treated with a slip on the outside only. From an early level of Period III.

Type XI. Bowl of dull-red ware with a vertical and externally rebated rim and corrugated straight sides carinated near the base which is almost flat. Of medium fabric, it is devoid of any slip or wash. From an early level of Period III.

Type XII. Bowl of dull-red ware with a vertical featureless rim; it is bluntly carinated towards a rounded base. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period III.

Type XIII. Fragment of a bowl of red ware with a vertical sharpened rim and incurved sides. Of fine fabric, it is treated with a bright-red slip both externally and internally. From a mid-level of Period III. *Variant XIIIa*, of red ware, differs from the main type in having an externally thickened rim and thicker walls. Of fine fabric, it is treated with a bright-red slip which has burnt black inside and red outside showing patches of black. From an early level of Period III.

Type XIV. Dish of dull-red ware with a vertical featureless rim, weakly ribbed internally. Of medium fabric, it is devoid of any slip or wash. The base prominently shows mica-dusting. From a mid-level of Period III.

Type XV. Dish of red ware with a vertical featureless rim; it is bluntly carinated towards the base. Of medium fabric, it is treated with a wash. From a mid-level of Period III. Variants of this type occur at Bhir Mound, Taxila. *Variant XVa*, of thick grey ware, has slightly widening sides. Of medium fabric, it is treated with a black slip on the outside. From a mid-level of Period III. *Variant XVb*, of thick grey ware, differs from the main type in being prominently carinated near the base which is almost flat. Of medium fabric, it is treated with a black slip on the outside. From an early level of Period III. *Variant XVc*, of thick grey ware, differs from the above in having a rounded base. Of medium fabric, it is treated with a black slip on the outside. From an early level of

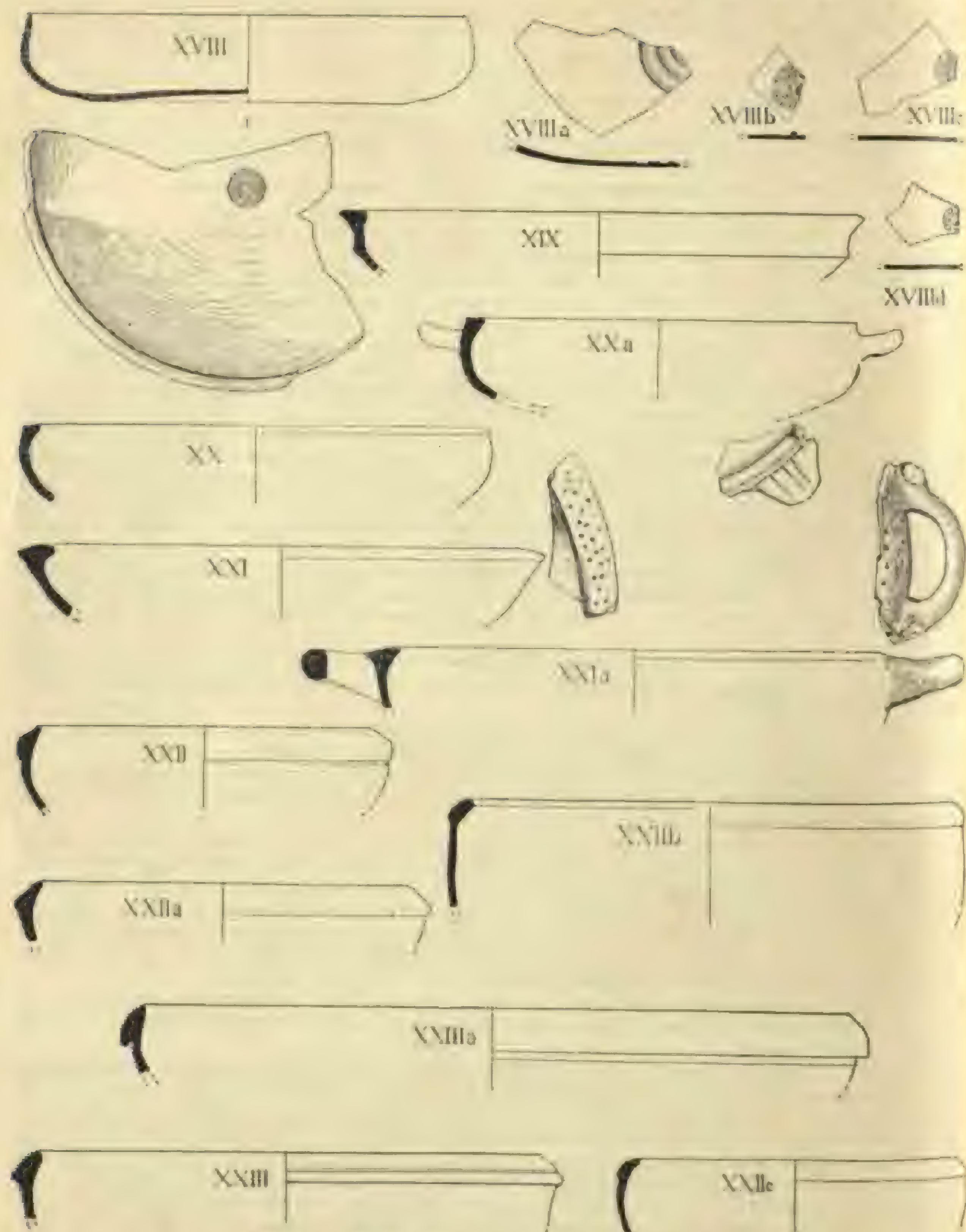


Fig. 16. *Pottery from Period III: other wares.* ¼

Period III. *Variant XVd*, of thick grey ware, differs from the above in having a closing rim and a prominent rib on the carination. Of medium fabric, it is treated with a slip both externally and internally. From the same level as above.

Type XVI. Dish of grey ware with a vertical featureless rim and internally corrugated sides bluntly carinated towards the base. Of fine fabric, it is treated with a wash. From an early level of Period III.

Type XVII. Dish or lid of red ware with a slightly out-turned rim, grooved on the top and flanged above the base. Of fine fabric, it is treated with a smooth slip both externally and internally. From an early level of Period III.

Type XVIII. Dish of grey ware with a vertical featureless rim and a flattish base. It is distinguished by a stamped design on the inner side of the base showing concentric grooves. Of fine fabric, it is treated with a slip both externally and internally. From an early level of Period III. It is of interest to note that the design is not in the centre. Such grey ware dishes with similar designs occur at Kauśāmbī, Vaiśālī and Pāṭaliputra and also in the N.B.P. Ware. *Variant XVIIIa* is the base-fragment of a dish of fine grey ware bearing on the inside a stamped design showing raised concentric bands. From an early level of Period III. *Variant XVIIIb* is the base-fragment of a dish of grey ware showing on the inside a stamped wheel-pattern with a ring of dots between the spokes and a raised knob at the centre. From an early level of Period III. *Variant XVIIIc* is the base-fragment of a grey ware dish bearing on the inside a stamped design showing a ring of raised *nandipadas* around a central circle. This symbol also occurs on punch-marked coins. From an early level of Period III. *Variant XVIIId* is the base-fragment of a dish of grey ware bearing on the inside a stamped design showing ring of raised dots enclosing a larger one in the centre. From an early level of Period III.

Type XIX. Dish of red ware with a vertical nail-head rim and a ridge above the base. Of fine fabric, it is treated with a smooth slip both externally and internally. From an early level of Period III.

Type XX. Basin of dull-red ware, indifferently fired, with a vertical internally thickened rim, flatly bevelled. Of medium fabric, showing a good deal of mica, it is devoid of any slip or wash. From a late level of Period III. *Variant XXa* differs from the main type in having a lug-handle marked with three incised lines. Of medium fabric, it is treated with a red slip and has a lot of mica-dusting on the base. From a mid-level of Period III.

Type XXI. Basin of red ware with a vertical nail-head rim, the top of which is distinguished by circular notches. Of medium fabric, it is treated with a red slip. From an early level of Period III. *Variant XXIa* differs from the above in having a loop-handle and triangular notches on the rim-top. Of medium fabric, it is treated with a red slip. From a mid-level of Period III.

Type XXII. Basin of grey ware with a vertical externally round-collared rim, obliquely cut. Of fine fabric, it is treated with a wash. From an early level of Period III. Such types of basins are met with in red ware also. The type along with its variants occurs at Kauśāmbī as well. *Variant XXIIa*, of red ware, differs from the above in having an obliquely bevelled rim. Of medium fabric, it is treated with a wash. From an early level of Period III. *Variant XXIIb*, of dull-red ware, differs from the main type in having an inverted externally elliptical-collared rim and straighter sides. Of medium fabric which has burnt black inside and red outside, it is treated with a thin slip. From a mid-level of Period III. *Variant XXIIc*, of red ware, differs from the main type in having an in-curved externally elliptical-collared rim. Of fine fabric, it is treated with a red slip both externally and internally. From a mid-level of Period III.

Type XXIII. Fragment of a basin of red ware with an incurved externally oval-collared and grooved rim. Of medium fabric, it is treated with a red slip both externally and internally. From a mid-level of a Period III. *Variant XXIIIa*, of grey ware, differs from the above in having an undercut rim. Of medium fabric, it is treated with a dark slip on the outside. From a mid-level of Period III.

Type XXIV. Basin of grey ware with an inturned externally round-collared rim distinguished by a lip. Of medium fabric, it is treated with a darkish grey slip both externally and internally. From a mid-level of Period III. The type is abundant at Kauśāmbī, Lachchhāgiri, Pāṭaliputra and Vaiśālī.

Type XXV. Basin of dark grey ware with an inturned and externally round-collared rim below which is a design showing oblique notches. Of medium fabric, it is treated with a black slip both

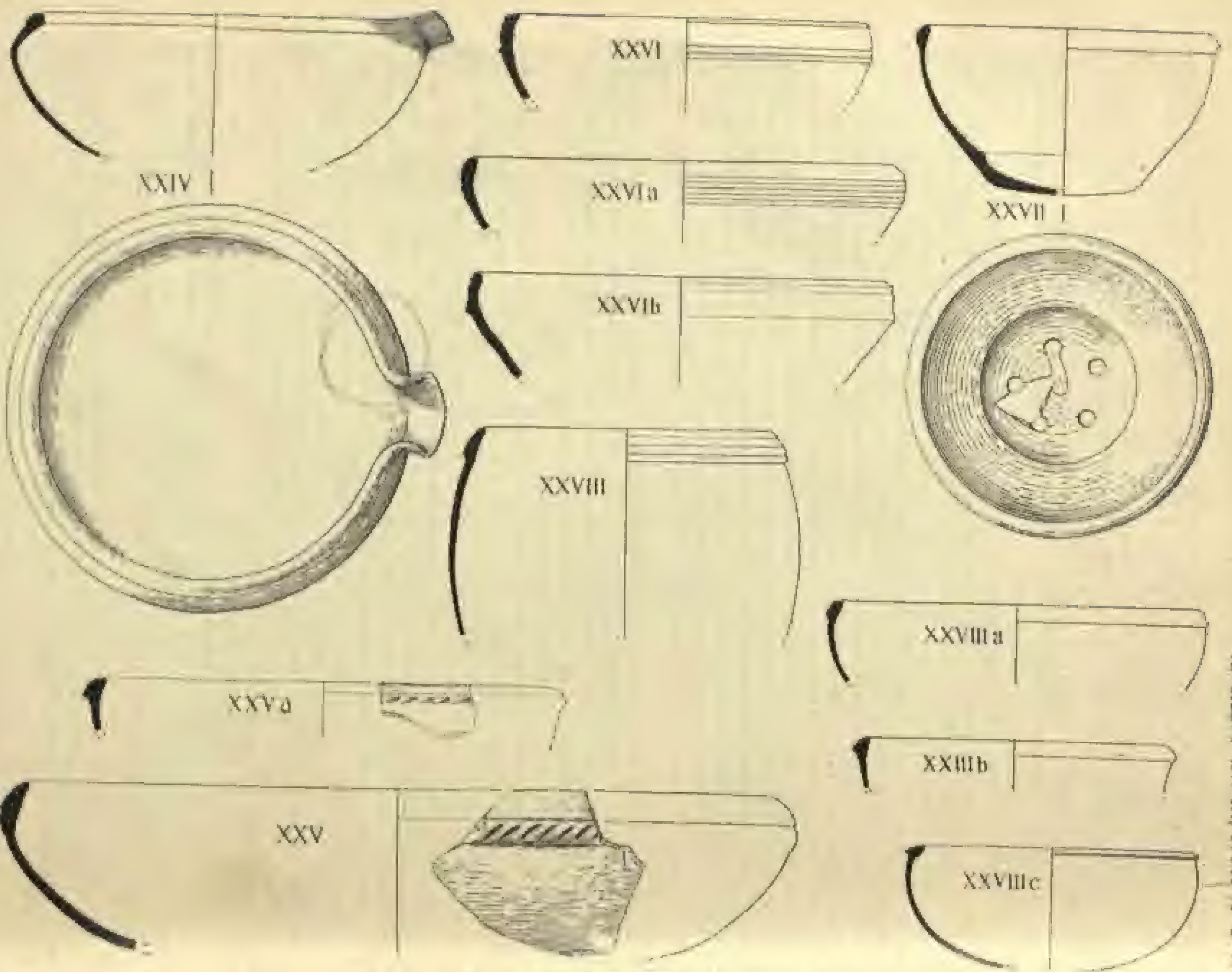


FIG. 17. Pottery from Period III: other wares.

externally and internally. From an early level of Period III. *Variant XXVa* differs from the above in having elliptical-collared rim, longer-spaced notches and a smoother surface. Of medium fabric, it is treated with a darkish slip. From an early level of Period III.

Type XXVI. Bowl of red ware with an incurved externally cordoned rim. Of fine fabric, it is treated with a slip both externally and internally. From an early level of Period III. *Variant XXVIa*, of red ware, indifferently fired, differs from the above in having an externally multi-grooved rim. Of medium fabric, it is treated with a wash both externally and internally. From an early level of Period III. *Variant XXVIb*, of red ware, differs from the main type in having a pronounced cordon and tapering sides. Of medium fabric, it is treated with a wash both externally and internally. From a late level of Period III.

Type XXVII. Basin of grey ware with an inturned externally collared rim and an internally ledged base which is distinguished by six perforations. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period III.

Type XXVIII. Deep bowl of dull-red ware, indifferently fired, with an inturned externally grooved and elliptical-collared rim. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period III. *Variant XXVIIIa*, of red ware, differs from the above in having an oval-collared rim and only one groove. Of fine fabric, it is treated with a smooth red slip both externally and internally. The type has been borrowed from Period II. From a mid-level of Period III. *Variant XXVIIIb*, of dull-red ware, differs from the main type in having an externally thickened and undercut rim. Of medium fabric, it is devoid of any slip or wash. From a late level of Period III. *Variant XXVIIIc*, of dull-red ware, differs from the above in having a nail-head rim, internally thickened. Of medium fabric, it is devoid of any slip or wash. The underside of the base shows lot of mica-dusting. From a mid-level of Period III.

Type XXIX. Vase of dull-red ware with a closing featureless rim. Of coarse fabric showing husk and grit, it is devoid of any slip or wash. From a mid-level of Period III. The type is also found at Bhir Mound, Taxila, and also exists in the N.B.P. Ware.

Type XXX. Basin of grey ware with an inturned featureless rim, high shoulders and expanding sides. Of fine fabric, it is treated with a slip only on the exterior. It is distinguished by an incised scale-pattern decoration below the shoulder. From an early level of Period III.

Type XXXI. Pear-shaped vase of dull-red ware, indifferently fired, with a vertical externally collared rim and a corrugated shoulder. There is no well-defined neck and the body abruptly starts below the rim. Of fine fabric and thin section, it is devoid of any wash or slip. Potted on a wheel, the body seems to have been beaten out to increase the girth. From an early level of Period III. This is one of the principal types of the Period and occurs along with its variants at Ahichchhatrā, Kauśāmbī, Taxila, Jhūsī, Bhiṭā and Vaiśāli. *Variant XXXIa* differs from the above in having a less pronounced body and a chamfered rim. Of finer fabric, it is devoid of any slip or wash. From the same level as above. *Variant XXXIb* differs from the main type in having an externally elliptical-collared rim and a weakly corrugated shoulder. Of finer fabric, it is devoid of any slip or wash. From an early level of Period III. *Variant XXXIc* differs from the main type in having a closing featureless rim, ridged above the neck. Of fine fabric, it is devoid of any slip or wash. From a late level of Period III. *Variant XXXId* differs from the above in having an out-curved featureless rim, more prominently ridged above the neck. Of fine fabric, it is devoid of any wash or slip. From an early level of Period III. *Variant XXXIe* differs from the above in having an out-turned sharpened rim and a corrugated body; like the above it is also devoid of any slip or wash. From a mid-level of Period III. *Variant XXXIf* differs from the main type in having an out-turned nail-head rim and a slight ledge below the shoulder. From a mid-level of Period III. *Variant XXXIg* differs from the above in having a sharpened rim with a prominent external rib. Of fine fabric, it is devoid of any slip or wash. From an early level of Period III. *Variant XXXIh* differs from the above in having a less pronounced ridge on the rim and is cylindrical. Of fine fabric, it is not treated with any wash or slip. From a mid-level of Period III. *Variant XXXIi* differs from the above in having a vertical externally thickened rim. Of fine fabric, it is devoid of any slip or wash. From an early level of Period III.

Type XXXII. Fragment of a vase of dull-red ware with a flared externally thickened rim. Of fine fabric, it is dusted over with mica both externally and internally. From an early level

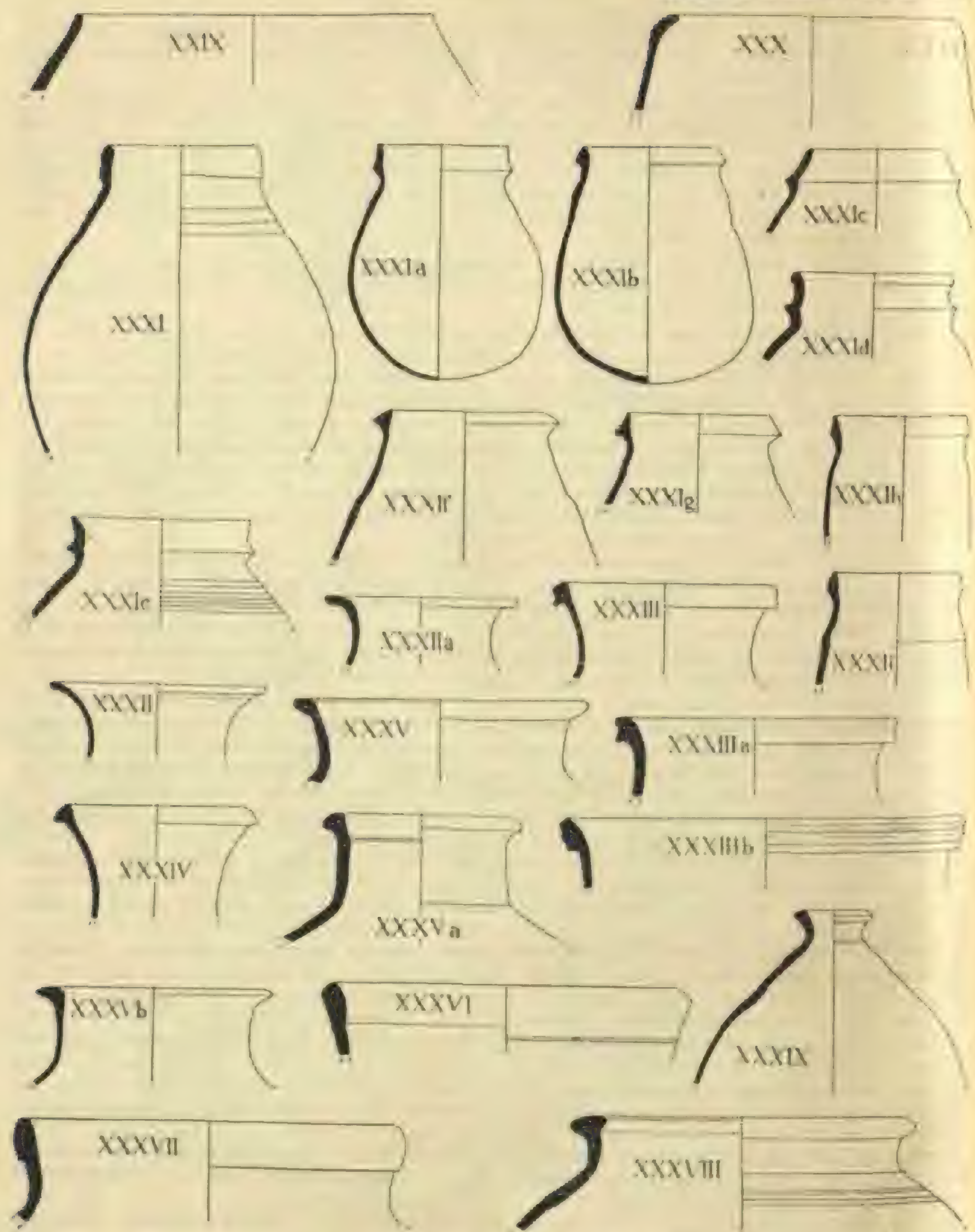


FIG. 18. *Pottery from Period III: other wares.* ¼

of Period III. *Variant XXXIIa* differs from the above in having a horizontally splayed-out featureless rim. Of medium fabric, it is treated with a wash. From a late level of Period III.

Type XXXIII. Fragment of a vase of pale-red ware with an externally collared and grooved rim and a concave neck. Of medium fabric, it is treated with a wash. From a late level of Period III. *Variant XXXIIIa*, of dull-red ware, differs from the above in having a vertical neck. Of medium fabric, it is not treated with any slip or wash. From an early level of Period III. *Variant XXXIIIb*, of dull-red ware, is multi-grooved externally. Of medium fabric, it is devoid of any slip or wash. From an early level of Period III.

Type XXXIV. Vase of pale-red ware with an out-curved nail-head rim. Of medium fabric, it is treated with a red slip which has burnt black near the rim due to contact with smoke. From an early level of Period III.

Type XXXV. Vase of dull-red ware with a clubbed rim. Of coarse fabric, it is not treated with any wash or slip. From an early level of Period III. *Variant XXXVa*, of grey ware, differs from the main type in having an everted thickened rim and a vertical neck. Of coarse fabric showing grit and husk, it is treated with a wash. From an early level of Period III. *Variant XXXVb*, of pale-red ware, differs from the main type in having a vertical neck. Of medium fabric, it is devoid of any slip or wash. From an early level of Period III.

Type XXXVI. Fragment of a vase of dull-red ware with an internally collared rim. Of coarse fabric, it is treated with a wash. From an early level of Period III.

Type XXXVII. Fragment of a jar of dull-red ware with an out-turned externally collared rim. Of coarse fabric, it is devoid of any slip or wash. The paste shows grit, husk and mica. From an early level of Period III.

Type XXXVIII. Fragment of a vase of dull-red ware with a nail-head rim and a grooved shoulder. Of coarse red fabric, it is treated with a wash. From a mid-level of Period III.

Type XXXIX. Vase of pale-red ware, indifferently fired, with an out-turned externally thickened rim, a narrow mouth, a concave neck and a weakly corrugated oblique shoulder. Of medium fabric, it is treated with a wash. From a mid-level of Period III. The type is available in grey ware also.

Type XL. Vase of grey ware with an out-turned thickened rim, a concave neck and a flattened sagger-base. Of comparatively fine fabric, it is treated with a slip. From an early level of Period III.

Type XLI. Vase of dull-red ware with an out-turned featureless rim, a bluntly carinated neck, a bold rib below the shoulder and a convex base. Of medium fabric, it is devoid of any slip or wash. The base shows lot of mica-dusting and from the soot sticking to the outer side of the vase it is apparent that the vase was used for cooking purposes. From an early level of Period III.

Type XLII. Vase of dull-red ware with a vertical internally oval-collared rim. Of medium fabric, it is devoid of any slip or wash. From an early level of Period III.

Type XLIII. Fragment of a vase of darkish grey ware with an everted featureless rim and expanding sides, weakly grooved both on the shoulder and the body. Of fine fabric, it is treated with a dark slip on the outside only. From an early level of Period III. Variants of this type occur at Bhir Mound, Taxila.

Type XLIV. Vase of red ware with a narrowing featureless rim, perforated at the shoulder with a ring of holes. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period III.

Type XLV. Miniature vase of dull-red ware with an everted internally bevelled rim, a low girth and a flat base. Of medium fabric, it is devoid of any slip or wash. The paste contains a good deal of mica. From a mid-level of Period III.

Type XLVI. Miniature vase of pale-red ware with an out-turned featureless rim, a concave neck, a thicker body and a flat base. Of medium fabric, it is treated with a wash. It is distinguished by a perforated bottom. From a late level of Period III.

Type XLVII. Miniature vase of dull-red ware with a closing sharpened rim, a carinated body and a round base. Of medium fabric, it is devoid of any slip or wash. From an early level of Period III.

Type XLVIII. Fragment of a bottle-necked vase of red ware with an externally grooved featureless rim. Of fine fabric, it is treated with a slip on the outside only. From an early level of Period III.

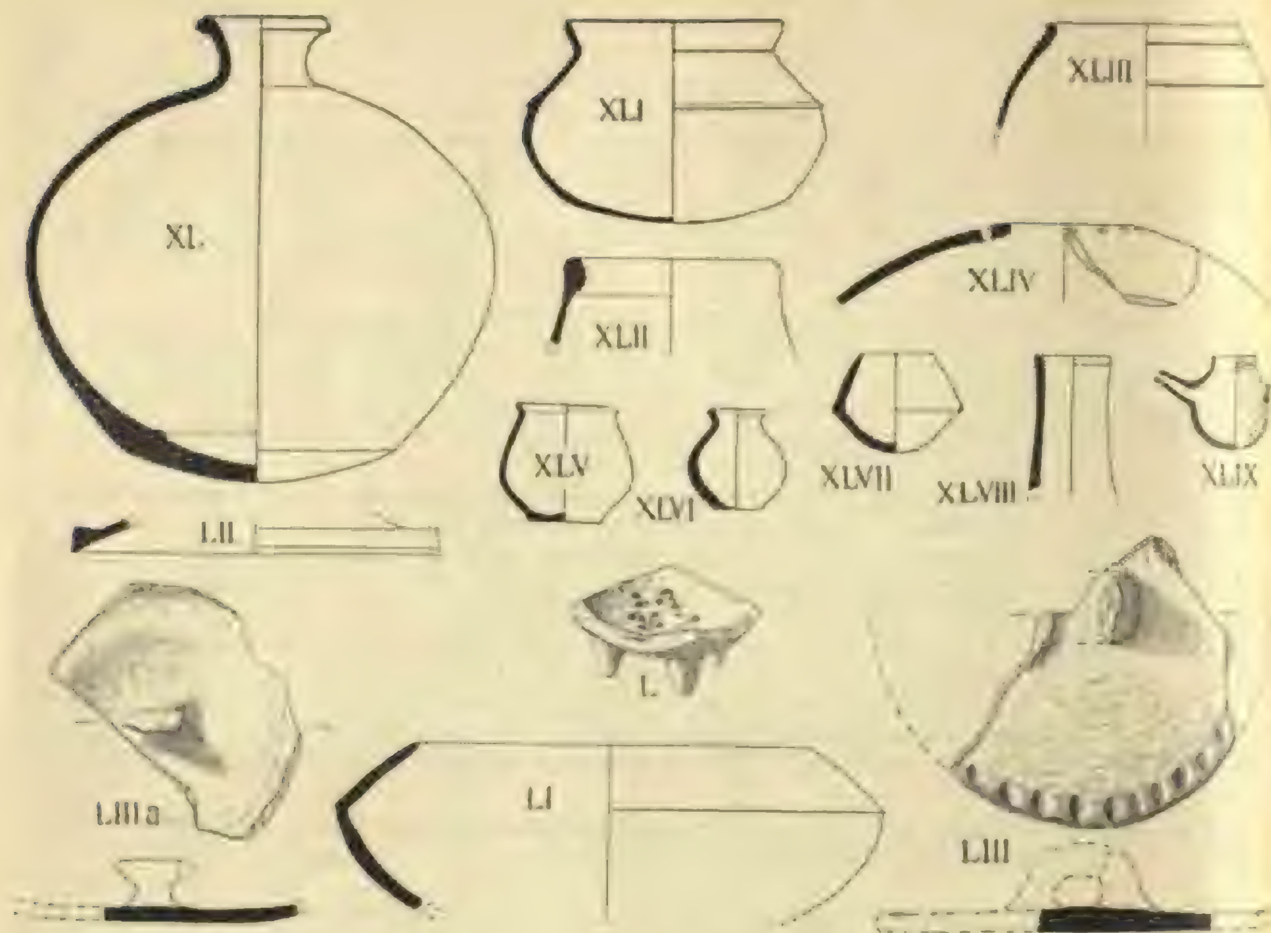


FIG. 19. *Pottery from Period III: other wares.* ¼

Type XLIX. Hand-made spouted vase of pale-red ware with a vertical rim and rounded base. It is distinguished by a lug-handle opposite the spout. Of fine fabric, it is treated with a wash. From an early level of Period III.

Type L. Three-footed base-fragment of a vase of red ware with perforations. Of medium fabric, it is treated with a wash. From an early level of Period III.

Type LI. Carinated *hāndī* of thick grey ware with a closing featureless rim and a rounded base. Of medium fabric, it is devoid of any slip or wash. It is in fact a variant of the type illustrated in the N.B.P. Ware (above, fig. 14, 10) and, as already stated (p. 53) it is represented both in the red ware and the N.B.P. Ware. From an early level of Period III.

Type LII. Lid of darkish grey ware with a thickened and externally grooved rim-base. Of comparatively fine fabric, it is treated with a black slip both externally and internally. From a mid-level of Period III.

Type LIII. Lid of red ware with a strap-handle. It is distinguished by a finger-tip decoration around the circumference. Of medium fabric showing husk and grit, it has burnt black on the underside and red at the top and is treated with a red slip at the top. From a mid-level of Period III. Similar lids are known at Ahichchhatrā, Vaiśālī, Kauśāmbī, etc. *Variant LIIIa* differs from the above in having a nail-head knob for lifting. Of medium fabric, it is treated with a wash. From an early level of Period III.

(v) *Period IV*

The pottery from Period IV is all wheel-made and is entirely of red ware. The fabric ranges from medium to fine. The larger percentage, however, is treated with a wash alone. The distinctive forms in this ware are: bowl (fig. 20, I); lid of the inkpot-type (fig. 20, XII); long bottle-necked sprinkler (fig. 20, XV); basin with a projecting spout; bowl-*cum*-lid with a central cup-like depression; and conical bowl of thin section (fig. 20, IV and VIII). Of these, the last two are confined to the upper levels. It is worth noting that the dish-type which was so popular in Periods II and III is significant by its absence here.

The ware is generally unpainted, though painted sherds were not altogether absent. The designs in this case are painted in black over bright-red surface and are usually executed on the rim and the shoulder. Recent explorations have shown that this industry has a fairly wide distribution, notably in Rājasthān. At Rangmahal, one of the Rājasthān sites, on the basis of a few terracotta plaques,[1] this industry has been dated to the early centuries of the Christian era.[2] At Hastināpura only a few fragments were recovered, and the most typical one is illustrated here (fig. 22, XLI).

A noteworthy feature of the pottery from this Period is the predilection for decorations. These are mostly stamped or impressed and show loops, fish, *triratnas*, leaves, rosettes, and wheel-patterns. Incised decorations also exist and comprise diamonds, etc. (fig. 23, 5). Applied designs consist of the *svastika* alone (fig. 21, XXXVII; pl. XXXI, 5).

Handled vases are very rare. No such intact vase has been found, although broken bits of handles do suggest their use. Spouts are fairly common and bear at the luting point stamped decorative designs, notable amongst which is a *makara* (pl. XXXII, 17). Some of the spouts, especially those fixed to the bottle-necked sprinklers, have also a sieve at the luting point. Most of these decorative designs appear on the pottery of the comparable period at Kauśāmbī.

The following select examples are illustrated:—

PLAIN POTTERY

Figs. 20-22

Type I. Bowl of dull-red ware with a vertical sharpened rim and sides tapering to a flat thickened base. Of medium fabric, it is treated with a wash. From an early level of Period IV. *Variant Ia* differs from the above in having slightly constricted sides. Of medium fabric, it is treated with a wash. From a mid-level of Period IV. *Variant Ib* differs from the main type in having a less pronounced sharpened rim. Of medium fabric, it is treated with a wash. From a mid-level of Period IV. *Variant Ic* differs from the above in having externally vertically cut rim. Of medium fabric, it is treated with a wash. From an early level of Period IV. *Variant Id* differs from the above in having an obliquely cut rim. Of medium fabric, it is devoid of any slip or wash. From a late level of Period IV. *Variant Ie* differs from the main type in having a ledge on the inner side below the rim. Of medium fabric, it is treated with a wash. From a mid-level of Period IV. *Variant If* is a miniature specimen having an obliquely bevelled rim and thickened sides. Of medium fabric, it is treated with a wash. From an early level of Period IV. *Variant Ig* is distinguished by a prominently vertical sharpened rim, ledged internally, and a footed base. Of medium fabric, it is treated with a red slip both externally and internally. From an early level of Period IV. This variant is confined to the upper levels of this period. *Variant Ih* differs from the

[1] Now displayed in the Bikaner Museum.
[2] Information from Shri A. Ghosh.

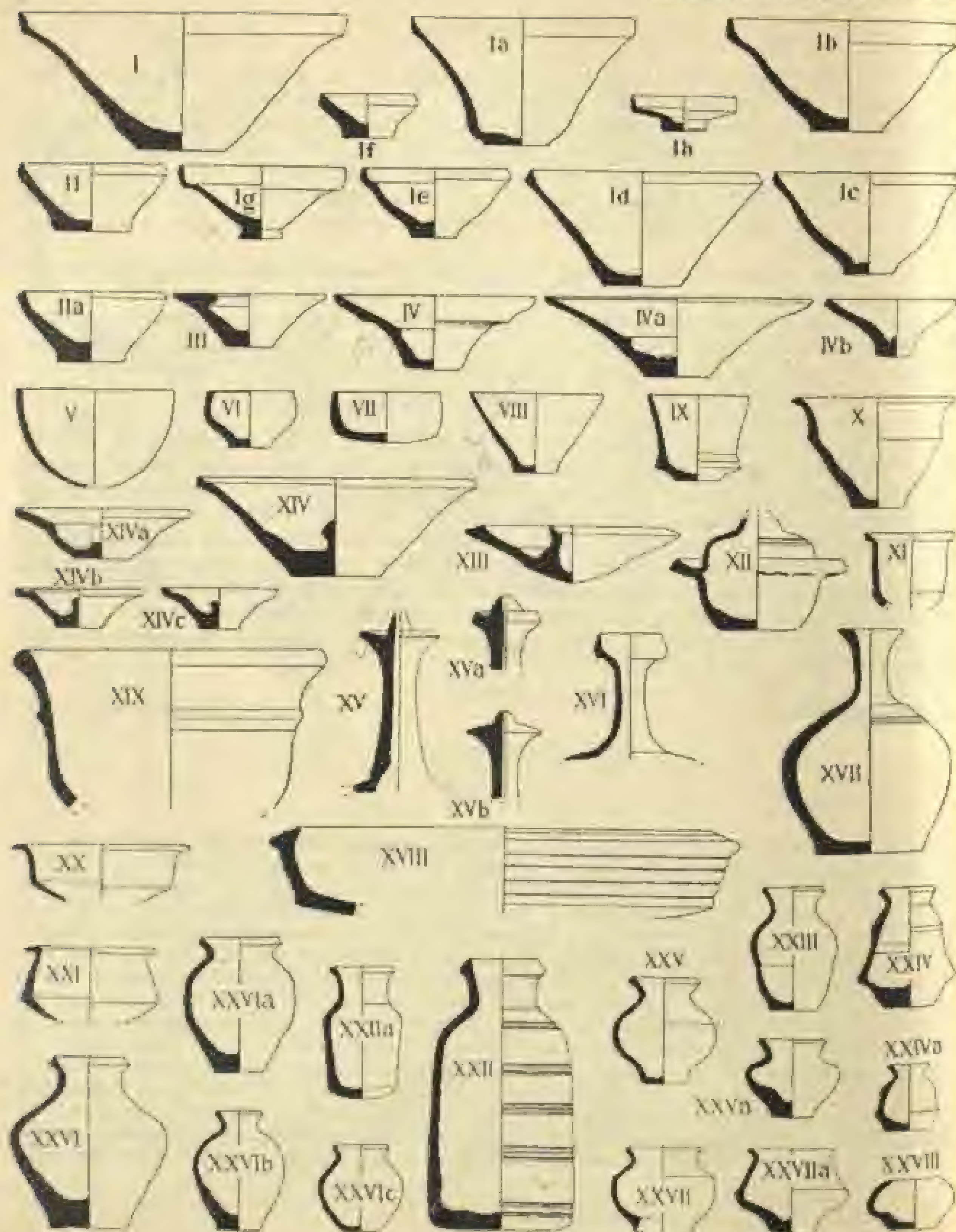


FIG. 20. *Pottery from Period IV: plain pottery.* ¼

above in being devoid of the inner ledge and having a grooved base. Of medium fabric, it is treated with a red slip on the outside only. From an early level of Period IV. This variant too is confined to the upper levels.

Type II. Shallow bowl of dull-red ware with an inturned rim and a flat base. Of medium fabric, it is treated with a wash. From a mid-level of Period IV. *Variant IIa* differs from the above in having an obliquely cut rim and has a deformed profile. Of medium fabric, it is treated with a wash. From a mid-level of Period IV.

Type III. Bowl of dull-red ware with a flared flat rim, grooved on the top, and a flat base. Of medium fabric, it is treated with a wash. From a late level of Period IV. It is not a common type.

Type IV. Lid of dull-red ware with a flared featureless rim; it is sharply carinated to a flat base making an inner central cup-like depression. Of medium fabric, it is treated with a wash. From a late level of Period IV. The type, like the above one, is restricted to the late levels of the Period. *Variant IVa* differs from the above in having an internal groove on the rim and a shallower inner depression. Of the same fabric as above, it is devoid of any wash or slip. From a late level of of Period IV. *Variant IVb* differs from the above in having a constricted base. Of medium fabric, it is devoid of any wash or slip. From an unstratified deposit of Period IV.

Type V. Bowl of red ware with a vertical featureless rim and a rounded base. Of fine fabric, it is treated with a red slip showing black patches on the outside. From an early level of Period IV.

Type VI. Miniature bowl of red ware with a vertical flat rim and a flat base. Of medium fabric, it is treated with a wash. From an unstratified deposit of Period IV.

Type VII. Hand-made miniature bowl of dull-red ware with a vertical featureless rim, straight sides and a flattish base. Of medium fabric, it is treated with a red slip on the outside. From an early level of Period IV.

Type VIII. Bowl of dull-red ware with a sharpened rim, thin tapering walls and a flat base. Of fine fabric, it is treated with a wash. From a late level of Period IV. The type is confined to the late levels alone.

Type IX. Bowl of dull-red ware with a vertical featureless rim, constricted sides, a cordon at the waist and a flat base. Of medium fabric, it is treated with a wash. From an early level of Period IV.

Type X. Bowl of red ware with an out-turned thickened rim, a boldly ridged shoulder and a flat base. Of medium fabric, it is treated externally with a slip. From an early level of Period IV.

Type XI. Bowl of red ware with a splayed-out thickened rim and straight sides; it is weakly ribbed near the base. Of medium fabric, it is treated with a wash. From a mid-level of Period IV.

Type XII. Inkpot-like lid with a prominently flanged waist and a flat thickened base. Of fine fabric, it is treated with a slip on the outside only. From a late level of Period IV. The type has analogues at Kauśāmbī.

Type XIII. Lid of dull-red ware, indifferently fired, with a thickened pointed rim and ink-pot-like central cup. Of medium fabric, it is devoid of any slip or wash. From an early level of Period IV. The type has analogues at Kauśāmbī, Pāṭaliputra and Mathurā.

Type XIV. Lid of dull-red ware with an externally vertically-cut flared rim, internally grooved, and having a flattish thickened base. It is distinguished by a central knob on the inner side of the base. Of medium fabric, it is treated with a wash. From an early level of Period IV. *Variant XIVa* differs from the above in having a splayed-out rim, ledged internally. Of medium fabric, it is devoid of any slip or wash. From a late level of Period IV. *Variant XIVb* is characterized by a broad horizontal groove on the rim and a higher central knob. Of medium fabric, it is treated with a wash. From an unstratified level of Period IV. *Variant XIVc* differs from the main type in having a less pronounced knob and a weak ledge on the inner side. Of medium fabric, it is devoid of any slip or wash. From a late level of Period IV.

Type XV. Bottle-necked sprinkler with a flanged rim-top and a conical knobbed opening. Of consistently fine fabric, it is treated externally with a bright-red slip. From an unstratified level of Period IV. The type is fairly widespread and occurs at Kauśāmbī, Jhūsī, Lachchhāgiri, Somnāth, etc. *Variant XVa* differs from the above in having an obliquely cut flanged rim. From a late level of Period IV. *Variant XVb* differs from the above in having a pointed flange. Of fine fabric, it is treated with a red slip on the outside. From an early level of Period IV.

Type XVI. Vase with a small vertical sharpened and externally collared rim forming a shallow receptacle above a bottle-neck. Of medium fabric, it is treated with a slip. From a mid-level of Period IV.

Type XVII. Vase of dull-red ware with an everted rim, a long vertical neck and a flat base. Of medium fabric, it is devoid of any slip or wash. From an unstratified level of Period IV.

Type XVIII. Dish of dull-red ware with a grooved nail-head rim, a multi-grooved body and a carinated waist. Of coarse fabric, it is devoid of any slip or wash. From an early level of Period IV.

Type XIX. Deep bowl of red ware with an out-turned thickened rim and a prominently ribbed body. Of medium thick fabric, it is devoid of any slip or wash. From a late level of Period IV.

Type XX. Shallow bowl of red ware with a horizontally splayed-out rim, vertical sides and a carination towards the base. Of medium fabric, it is treated with a slip both externally and internally. From a late level of Period IV.

Type XXI. Deep bowl of red ware with a clubbed rim, a low girth and a carination towards the rounded base. Of fine fabric, it is treated with a slip on the outside. From a mid-level of Period IV.

Type XXII. Bottle of red ware with an externally thickened and obliquely cut rim, a short vertical neck, a grooved shoulder, a multi-grooved cylindrical body and a flat base. Of medium fabric, it is devoid of any slip or wash. From an upper level of Period IV. *Variant XXIIa* is a miniature bottle of red ware with an out-turned thickened rim, convex neck and an imperfectly flat base. Of medium fabric, it is devoid of any slip or wash. From a late level of Period IV.

Type XXIII. Miniature vase of drab-red ware with an out-turned rim, a concave neck, a weakly corrugated body and a narrow flat base. Of medium fabric, it is devoid of any slip or wash. From a late level of Period IV.

Type XXIV. Miniature vase of dull-red ware with an out-turned featureless rim, a ledged shoulder, a low girth and a sharp constriction above a flat base. Of medium fabric, it is treated with a wash. From an early level of Period IV. *Variant XXIVa* differs from the above in having a carinated neck. Of the same fabric as above. From a dump ascribable to Period IV.

Type XXV. Miniature vase of drab-red ware with an out-turned rim, a concave neck, a globular body and a narrow flat base. It is distinguished by a weak ledge on the body. Of medium fabric, it is treated with a slip up to the shoulder. From an early level of Period IV. *Variant XXVa* differs from the main type in having a squared shoulder and a heavier base. From an upper level of Period IV.

Type XXVI. Vase of dull-red ware with an out-turned externally obliquely bevelled rim, a concave neck, an oblique shoulder and a thickened flat base. Of coarse fabric, it is treated with a wash. From a mid-level of Period IV. *Variant XXVIa* differs from the above in having a bluntly carinated neck and an ellipsoidal body. Of medium fabric, it is treated with a wash. From an early level of Period IV. *Variant XXVIb* differs from the above in having an out-turned featureless rim. Of medium fabric, it is treated externally with a slip. From a mid-level of Period IV. *Variant XXVIc* differs from the above in having a globular profile. Of the same fabric as above, it is treated with a wash. From a mid-level of Period IV.

Type XXVII. Miniature vase of dull-red ware with an out-turned rim, a ledged shoulder and a round body. Of fine fabric, it is treated with a bright-red slip. From a late level of Period IV. *Variant XXVIIa* differs from the above in having an oblique shoulder, a low girth and a prominent ledge. Of medium fabric, it is treated with a wash. From a late level of Period IV.

Type XXVIII. Miniature vase of dull-red ware with a narrowing featureless rim and a flat base. Of medium fabric, it is treated with a wash. From a mid-level of Period IV.

Type XXIX. Vase of red ware with a concave shoulder, an internally-grooved ovoid body and a thickened flat base. It is further distinguished by a handle decorated with nail-tip depression. Of medium fabric, it is treated with a bright-red slip. From a mid-level of Period IV.

Type XXX. Vase of dull-red ware with an out-turned thickened rim, a vertical neck and a convex shoulder. Of medium fabric, it is treated with a wash. From an early level of Period IV. *Variant XXXa* differs from the above in having a more prominently thickened rim and a concave neck. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period IV.

Type XXXI. Vase of red ware with a slightly out-turned rim, a rib at the shoulder and a globular body. Of medium fabric, it is treated with a red slip. From an early level of Period IV.

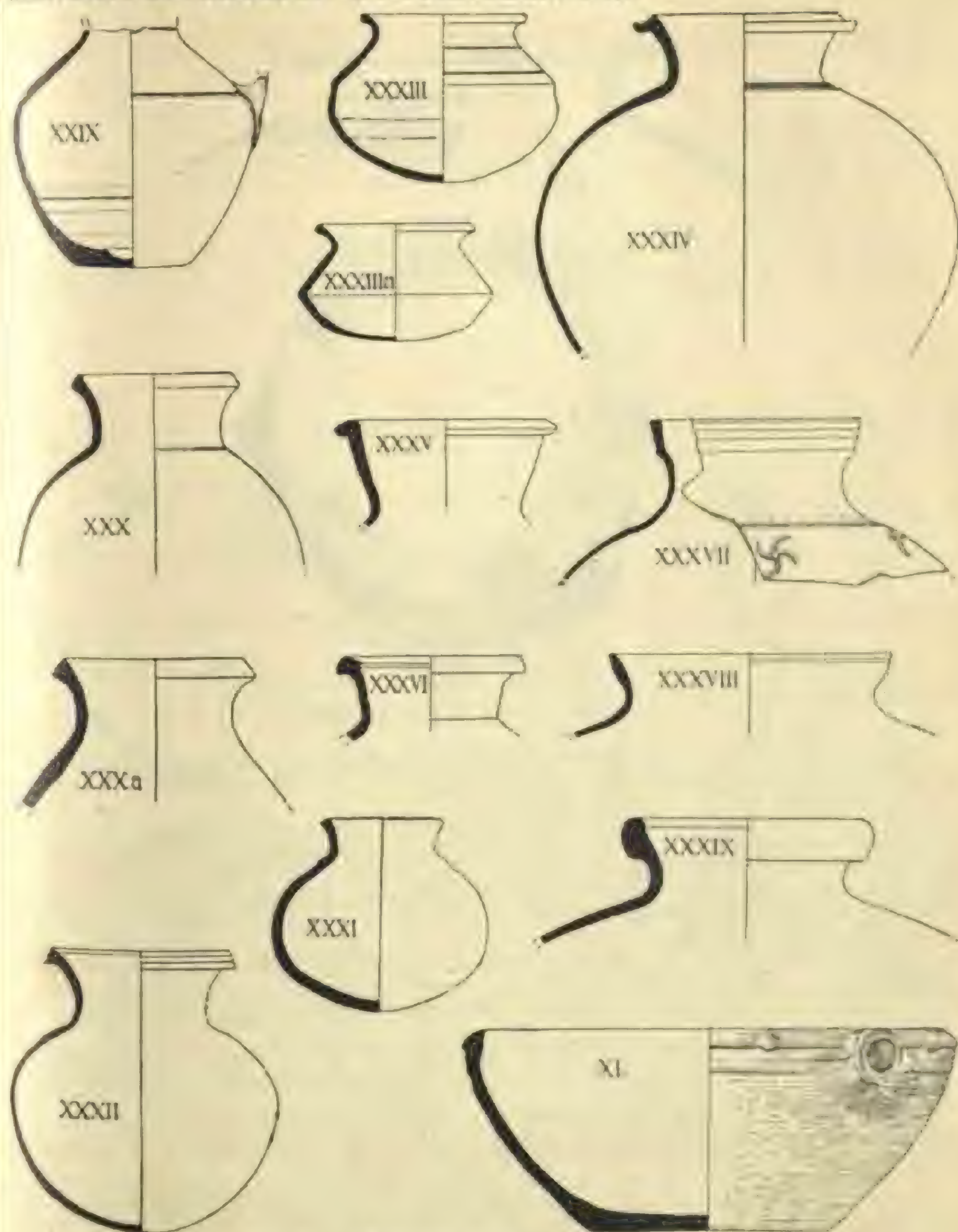


FIG. 21. *Pottery from Period IV: plain pottery.* $\frac{1}{4}$

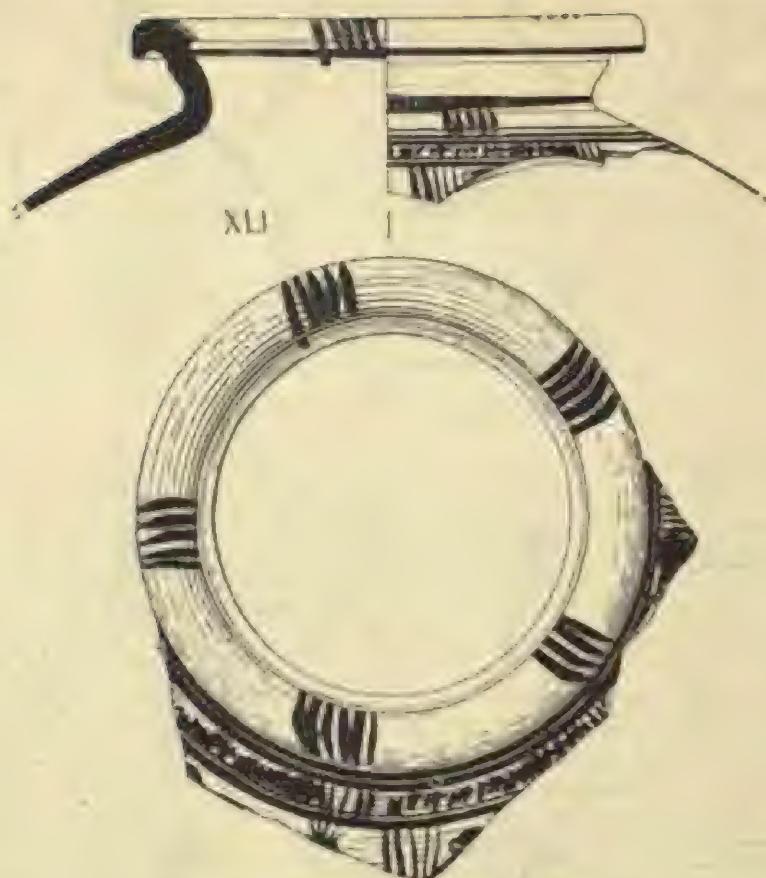


Fig. 22. *Painted pot from Period IV.* ¼

Type XXXII. Vase of dull-red ware with an out-turned externally thickened and grooved rim, a concave neck and a rounded body. Of medium fabric, it is treated with a wash. From a mid-level of Period IV.

Type XXXIII. Vase of dull-red ware with an out-turned rim, an oblique shoulder, a bluntly carinated body and a rounded base. Of medium fabric, indifferently fired, it is treated with a wash and is presumably meant for cooking as evidenced by the presence of soot on the base. From an unstratified level of Period IV. *Variant XXXIIIa* differs from the above in having a prominently carinated body and an out-turned thickened rim. Of the same fabric as above, it is devoid of any slip or wash. From a mid-level of Period IV.

Type XXXIV. Vase of red ware with a rebated rim, grooves at the neck and a globular body. Of medium fabric, indifferently fired, it is treated with a red slip down to the shoulder, the rest of the body being smeared with a paste of clay and husk. From a mid-level of Period IV.

Type XXXV. Vase of red ware with a vertical externally clubbed rim and an expanding neck. Of medium fabric, showing husk in the paste, it is devoid of any slip or wash. From a mid-level of Period IV.

Type XXXVI. Vase of red ware with an out-turned pointed nail-head rim and a roughly vertical neck. Of medium fabric, it is treated externally with a bright-red slip. From an early level of Period IV.

Type XXXVII. Vase of red ware with a vertical externally rib-collared rim and a concave neck; it is distinguished by notches above the grooved shoulder and a *swastika* and knotted loop-pattern in appliqué over the body. Of medium fabric, it is treated externally with a red slip. From an early level of Period IV.

Type XXXVIII. Vase of red ware with an out-turned externally thickened and grooved rim and a concave neck. Of medium fabric, it is treated with a wash. From a mid-level of Period IV.

Type XXXIX. Jar of red ware with an out-turned oval-collared rim, slightly undercut from inside, and a bulged profile. Of coarse fabric, it is treated with a slip on the outside. From a mid-level of Period IV.

Type XL. Basin of dull-red ware with an inturned externally collared rim and a flat base. It is distinguished by a projecting spout. Of medium fabric, it is treated with a thin slip. From an early level of Period IV. The type is fairly abundant at Kauśāmbī in levels of comparable period.

Type XLI. Vase of bright-red ware with a drooping rim, ledged internally. Of comparatively fine fabric, it is treated with a bright-red slip and is painted in black with five equally-spaced groups of four strokes each on the rim-top and a panel of vertical lines and an indeterminable design enclosed by horizontal bands on the shoulder. From a late level of Period IV.

Decorated pottery

Fig. 23

1. Vase of red ware with a splayed-out externally thickened and grooved rim decorated on the shoulder with a stamped design formed by a panel of leaves and circles below inverted loops

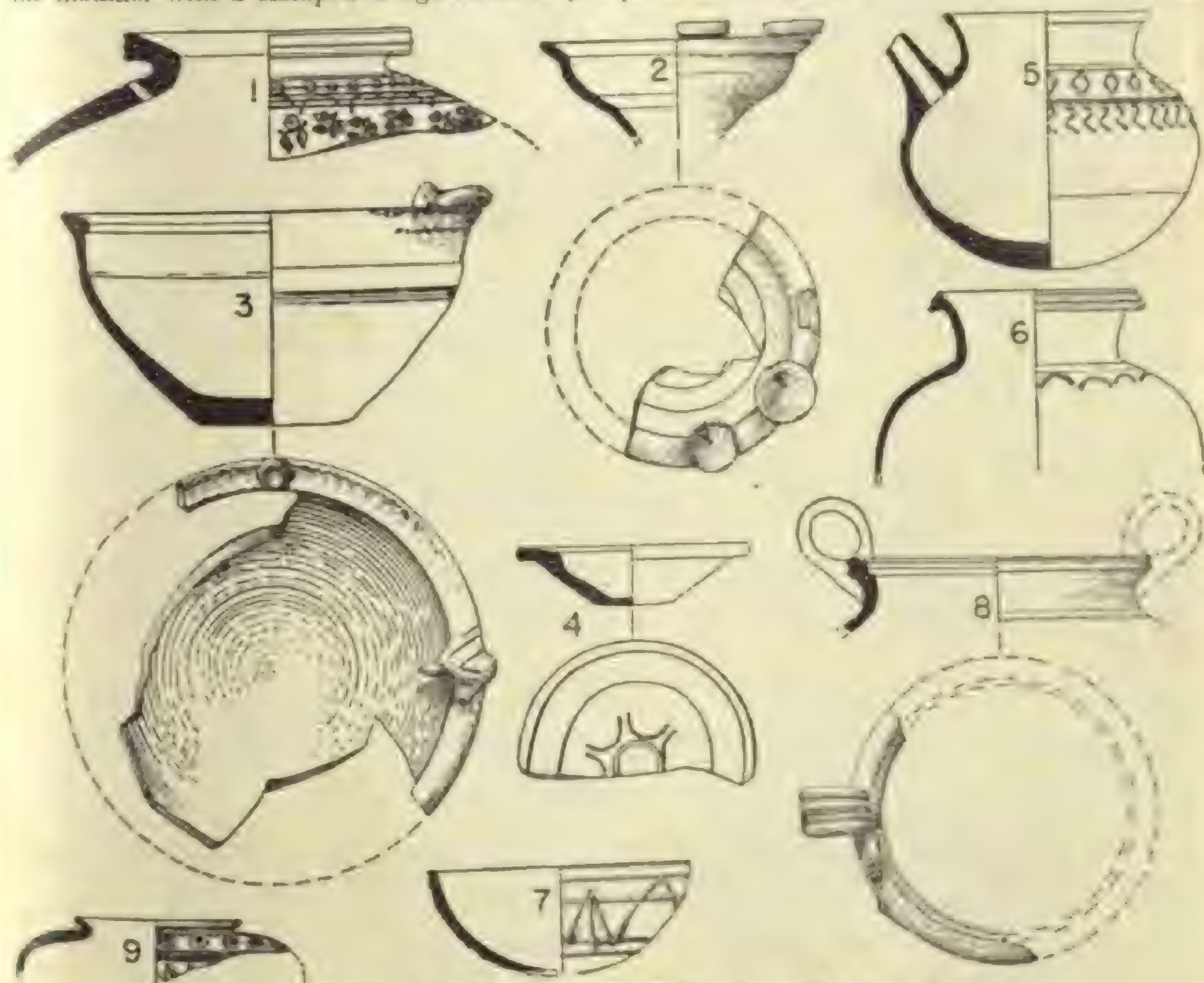


Fig. 23. *Pottery from Period IV: decorated pottery.* ¼

occurring in incised horizontal lines and squares. Of medium fabric, it is treated with a slip. From an early level of Period IV.

2. Bowl of dull-red ware with a flared featureless rim. It is distinguished by two shallow cup-like things on the rim. Of medium fabric, it is treated with a wash. From an early level of Period IV.

3. Basin of red ware with a nail-head rim and a flat base. The rim-top is decorated with a bird in appliqué and a shallow cup-like depression. Of medium fabric, it is treated with a slip both externally and internally. From a mid-level of Period IV.

4. Bowl of red ware with a splayed-out rim and a flattened base. On its inner side is a design formed by loops of dots enclosing two concentric circles. From a mid-level of Period IV.

5. Spouted vase of red ware with an out-turned rim, a globular body and a thickened round base. It is decorated with an incised design formed by a panel of diamonds above hooks. Of medium fabric, it is treated externally with a red slip. From a mid-level of Period IV.

6. Vase of pale-red ware with an out-turned externally thickened and grooved rim and a concave neck. It is decorated on the shoulder with an incised design formed by disconnected loops. Of medium fabric, it is treated externally with a red slip. From an early level of Period IV.

7. Bowl of red ware with a vertical flat-topped rim and a rounded base. It is decorated with a moulded design formed by bold triangles in relief cut by horizontal lines. Of comparatively fine fabric, it is treated externally with a slip. From a mid-level of Period IV.

8. Rim-fragment of a vase of polished red ware with a loop-handle on the top which is further decorated with an applied design formed by cutting a knob into four quadrants. From a late level of Period IV.

9. Fragment of a vase of red ware with an out-turned rim, a carinated neck and a convex shoulder which is decorated with a stamped design formed by a panel of dots between bands of regular notches. Of fine fabric, it is treated with a red slip. From an early level of Period IV.

Pls. XXXI and XXXII

1. Fragment of a vase of red-slipped ware decorated with an impressed fish-design. From a late level of Period IV.

2. Fragment of a vase of red-slipped ware decorated with an incised *triratna*. From a mid-level of Period IV.

3. Fragment of a vase of red-slipped ware decorated with a panel of notched circles. From an early level of Period IV.

4. Fragment of a vase of red-slipped ware decorated with an incised conventionalized palm. From a mid-level of Period IV.

5. Fragment of a vase of red-slipped ware decorated with an impressed *swastika* enclosed within two conches. From an early level of Period IV.

6. Fragment of a vase of black-slipped grey ware, decorated with a stamped design of elephants in a panel. From a late level of Period IV.

7. Fragment of a vase of red-slipped ware decorated with an impressed panel of leaf-design. From a late level of Period IV.

8. Fragment of a vase of red-slipped ware decorated with impressed flowers. From a late level of Period IV.

9. Fragment of a vase of pale-red ware decorated with an impressed design of three panels of notches, circles and chevrons. From a late level of Period IV.

10. Fragment of a vase of red-slipped ware decorated with an impressed design formed by loops. From a late level of Period IV.

11. Fragment of a vase of red-slipped ware decorated with an impressed design consisting of panels of diamonds and loops. From an early level of Period IV.

12. Fragment of a vase of red-slipped ware decorated with an impressed design consisting of loops enclosing concentric circles above a line of vertical notches. From a mid-level of Period IV.

13. Fragment of a vase of red ware decorated with an impressed leaf-like pattern. From a late level of Period IV.

To face page 70



Decorated pottery. Period IV (see pages 70 and 71)



Decorated pottery, Period IV (see page 70)



Glazed ware, Period V (see pages 71-73)



Glazed ware, Period V (see page 74)



Decorated pottery, Period V (see page 82)

14. Fragment of a vase of red ware decorated with a stamped design of circles with spokes in a panel. From an early level of Period IV.

15. Fragment of a vase of grey-slipped ware decorated with a stamped design of circles with spokes below hook-shaped notches. From a late level of Period IV.

16. Fragment of a vase of red-slipped ware decorated with an impressed design consisting of concentric circles and loops enclosing diamonds. From a late level of Period IV.

17. Spout of pale-red ware decorated with tortoise-shaped moulding. From a mid-level of Period IV.

18. Fragment of a vase of red-slipped ware decorated with an impressed design consisting of panels of conventionalized leaves, circles cut into four quadrants, lozenges, etc. From an early level of Period IV.

19. Fragment of a vase of red-slipped ware decorated with an impressed design consisting of loops and concentric circles in a panel above oblique incisions. From an unstratified deposit of Period IV.

(vi) *Period V*

1. Glazed ware.—There are two principal classes of glazed ware found at Hastināpura, the more outstanding of which is of a whitish colour and of a sandy friable texture (fig. 24, 1-10). The particles of which it is composed are hard, having little or no cohesion. The core is virtually a sandy mass difficult to form into shapes. It was difficult to manipulate the coarse sandy paste into forms either complicated or of large dimensions. The vases, therefore, are of two types only, viz. the shallow bowl and the plate. Ring-base is a distinctive feature of this class and was adopted by the local ware as well. Some of these vases are purely ornamental and could not have been used for regular domestic purposes. The designs which are both floral and geometric are executed either in blue or chocolate-brown picked out with white. It appears that the design was painted in the required colour directly on the 'bisque', and thereafter the entire vase was coated with a film of glaze, which, in some cases, also showed an additional silvery lustre. The technique of painting is essentially underglaze. The inner bases of these plates also show, very distinctly indeed, marks of the ring-foot to separate each plate in the saggar for the glaze-firing. This type of pottery is also known in Afghanistan, where it is termed as Timurid pottery.[1] It is, therefore, an imported industry which the Muslim invaders brought along with them. At Hastināpura it was found in levels contemporary with and posterior to that yielding the coin of Balban (A.D. 1266-87) and may, therefore, belong to the thirteenth century and after.

The second class (figs. 24 and 25, 11-32), although imitating the above in form, has the normal pottery-fabric, red medium core and crackled glazed surface. The painted designs fall into three groups. In one case they are executed in turquoise shown with deep green. The colour-effects were no doubt achieved by the use of metals, possibly by the presence of iron in ferrous conditions.[2] The 'crazing' may be due to the larger thermal expansion of the glaze. The designs mostly follow flower-patterns. In the second case the designs are painted in green filled in with red or chocolate-brown shown with pinkish buff. In addition to the crackling, the glaze sometimes shows a granular surface. Noteworthy type is that of a lid (fig. 25, 26). The third group has the design executed in green and white shown with tan-brown. Its fabric, however, is similar to the second and third varieties discussed above.

[1] Information from Mon. Jacque Christoph of the Mission Archéologique Française en Afghanistan.

[2] A. L. Hethington, *Chinese Ceramic Glazes* (Cambridge, 1937), pp. 15 ff.



Fig. 24. Pottery from Period V: glazed ware

The selected sherds are listed below:—

Class I: Specimens of whitish sandy friable texture

Fig. 24

1. Bowl with an out-turned featureless rim and a ring-base. Of sandy whitish fabric, it is painted in chocolate-brown picked out with white on the inside with two horizontal rim-bands above groups of small converging lines alternating with petals and on the base with a floral design. The outside is plain. From a mid-level of Period V. Also pl. XXXIII, 4.

2. Fragment of a deep bowl with a ring-base. Of sandy whitish fabric, it is painted in blue picked out with white on the inside base with groups of leaves and circles with dots enclosed in two circles bordered with flower-plants shooting towards the sides. From a mid-level of Period V.

3. Plate with a horizontally splayed-out sharpened rim and a convex waist. Of whitish sandy fabric, it is painted in chocolate-brown picked out with white and filled in with green (hatched in the drawing) on the inside with a panel of banner-like design enclosed within bands on the rim and long pointed leaves on the sides. In addition, the entire surface of the pot shows a lustrous film. From an early level of Period V. Also pl. XXXIII, 1.

4. Plate with splayed-out rim. Of whitish sandy fabric, it is painted in blue picked out with white on the inside with a creeper enclosed within bands on the rim and a flower-plant on the sides and on the outside in chocolate-brown picked out with white with a panel of zigzags and vertical lines. From a late level of Period V. Also pl. XXXIII, 3.

5. Plate with a splayed-out rim, convex sides and a ring-base. Of whitish sandy fabric, it is painted in chocolate-brown picked out with white on the inside with three different geometric panels on the rim, sides and base and on the outside with vertical strokes enclosed within horizontal lines. From an early level of Period V.

6. Plate with a ring-base. Of whitish sandy fabric, it is painted in blue picked out with white on the inside with a design consisting of opposite triangles partly filled on the rim and a floral pattern on the base and on the outside with a flower-plant design. From a pit belonging to the late levels of Period V.

7. Plate with a ring-base. Of whitish sandy fabric, it is painted in chocolate-brown picked out with white on the inside with groups of close vertical lines alternating with wider-spaced ones bordering a circle with a central flower-pattern and loops with chequer-design and on the outside with a vertical line. From a mid-level of Period V.

8. Plate with a ring-base. Of whitish sandy fabric, it is painted in blue picked out with white on the inside with radiating lines bordering a circle enclosing four rows of spirals. From a late level of Period V. Also pl. XXXIII, 6.

9. Plate with a ring-base. Of whitish sandy fabric, it is painted in chocolate-brown picked out with white on the inside with a circle enclosing chequer-designs. From a mid-level of Period V. Also pl. XXXIII, 2.

10. Plate with a ring-base. Of whitish sandy fabric, it is painted in blue picked out with white on the inside with a design consisting of joined hexagons with central dots and connecting lines. From a late level of Period V. Also pl. XXXIII, 5.

Class II: Specimens with normal pottery-fabric

Figs. 24 and 25

11. Bowl with an out-turned sharpened rim and a ring-base. Of red medium core and crackled surface, it is painted in turquoise shown with deep green on the inside with two horizontal rim-bands and a panel of plant-pattern on the sides. From a late level of Period V.

12. Shallow bowl with a splayed-out internally sharpened rim and a ring-base. Of red medium core and crackled surface, it is painted in turquoise shown with deep green on the inside

with two central concentric circles enclosing petals and an indeterminate design below the rim. From a late level of Period V. Also pl. XXXIV, 2.

13. Bowl with an oblique splayed-out internally sharpened rim. Of red medium core and crackled surface, it is painted in turquoise shown with deep green on the inside with a creeper-design. From a mid-level of Period V. Also pl. XXXIV, 1.

14. Bowl of the type similar to 13. It is painted in light green shown with deep green on the inside with vertical strokes enclosed within horizontal lines on the rim. From a mid-level of Period V.

15. Plate with a horizontally splayed-out rim. Of red medium core and crackled surface, it is painted in turquoise shown with deep green on the inside with a horizontal rim-band and an irregular circle with a big dot below the rim. From a late level of Period V.

16. Fragment of a plate with a ring-base. Of red medium core and crackled surface, it is painted in turquoise shown with deep green on the inside with a circle enclosing frilled loops round an indeterminate floral pattern. From a mid-level of Period V. Also pl. XXXIV, 3.

17. Fragment of a plate with a ring-base. Of red medium core and crackled surface, it is painted in turquoise shown with deep green on the inside with a quadrant of a circle enclosing a double-tanged arrow-head. From a late level of Period V.

18. Fragment of a plate with a ring-base. Of red medium core and crackled surface, it is painted in turquoise shown with deep green on the inside with two concentric circles enclosing clockwise hooks converging to a common centre and indeterminate patterns along the inner periphery. From a mid-level of Period V.

19. Fragment of a bowl with a ring-base. Of red medium core and crackled surface, it is painted in light green shown with deep green on the inside with three concentric circles enclosing an incomplete design. From a late level of Period V.

20. Plate with a splayed-out rim and a ring-base. Of red medium core and crackled surface, it is painted in green (hatched in the drawing) filled in with red and shown with white on the inside with a lotus-pattern. From surface-collection.

21. Plate with a flared externally thickened rim and a convex waist. Of red medium core and crackled surface, it is painted in chocolate filled in with green (hatched) and shown with creamish pink on the rim with panels of quadrufoils. From the latest level of Period V.

22. Fragment of a plate with a ring-base. Of red medium core and crackled granular surface, it is painted in chocolate filled in with green and shown with white on the inside with a circle divided into six segments each enclosing an arrow-head in an anti-clockwise direction. From a dump belonging to the late levels of Period V. Also pl. XXXIV, 5.

23. Fragment of a bowl with a ring-base. Of red medium core and crackled granular surface, it is painted in green shown with creamish pink on the inside with a design consisting of intersecting loops. From a late level of Period V.

24. Fragment of a plate with a ring-base. Of red medium core and granular surface, it is painted in green shown with creamish buff on the inside with a design consisting of converging hooks. From the latest level of Period V. Also pl. XXXIV, 4.

25. Plate with a ring-base. Of red medium core and crackled granular surface, it is painted in chocolate-brown filled in with green (hatched) shown with creamish pink on the inside with a circle enclosing another with mat criss-cross design. From a late level of Period V. Also pl. XXXIV, 6.

26. Lid with a hollow cup-like terminal. Of red medium core and crackled granular surface, it is painted in white filled in with green and shown with brown on the outside with a design consisting of leaves enclosed within triangles etc. From a late level of Period V.

27. Bowl with a ring-base. Of red medium core and crackled surface, it is painted in bluish green shown with brown on the inside base with a star-pattern. From a late level of Period V.

28. Bowl with an internally sharpened rim and rounded sides. Of red medium core and crackled granular surface, it is painted in bluish green filled in with white (hatched) and shown with brown on the inside with horizontal bands and vertical irregular strokes. From a late level of Period V.



Fig. 25.—*Pottery from Period V: glazed ware.* ¼

29. Plate with a flared featureless rim and a ring-base. Of red medium core, it is painted on the inside with a loop-design on the rim and concentric circles on the base. From the latest level of Period V.

30. Plate with a flared externally thickened rim. Of red medium core, it is painted in white filled in with green and shown with brown on the inside with a horizontal rim-band and arched lines. From a late level of Period V.

31. Plate with an internally sharpened rim. Of red medium core, it is painted in white filled in with light green and shown with brown on the inside with irregular lines between three horizontal bands on the sides. From a late level of Period V.

32. Fragment of a plate with a ring-base. Of red medium core and crackled surface, it is painted in green filled in with white and shown with brown on the inside with a design consisting of two concentric circles enclosing a closed spiral and anti-clockwise arcs with a common central origin. From a mid-level of Period V.

II. Other wares.—Pottery from Period V is almost of dull-red colour and, in general, of a coarse fabric. The entire pottery is wheel-made. The paste, as a rule, is medium, sometimes coarser, tempered with sand which often contains larger particles of grit. Usually no surface-wash is met with and, wherever available, it approximates to the colour of the paste. A pleasing effect is produced on some of the vessels by mixing powdered mica in the paste or by dusting it on the pots before firing. Vases are usually more absorbent. The firing is good, but instances of deformed pots due to unequal or bad firing are also noticed.

The commonest shapes met with are: knife-edged bowl (fig. 26, I); lid either of inverted platter-type with flat terminal or cup-shaped with cone-like hollow knobs in the centre (fig. 26, XIII-XV); vase with partially decorated rim (fig. 28, XXXVI); flat plate (fig. 28, XLIII); and a distinctive sharply carinated cooking vase (fig. 27, XXII). Spouted vases are another feature of the Period; sometimes the spouts are double-mouthed. Unlike those in Period IV, these spouts are all plain.

Decorations are also met with. They comprise applied incised and stamped patterns. The applied pattern usually consists of a rope-design done at two places on the rim of the vase. Analogues occur at Ahichchhatrā.[1] Incised decorations consist of grouped oblique incisions. Of the stamped design, the most prolific is the chequer-pattern, the depressions being filled with mica. Panels of creepers in relief dusted over with mica also occur on some of the pots (pl. XXXV, 2 and 3). The latter are, however, confined to the upper levels.

Some of the pots also bear painted designs executed in black on red surface. This painted pottery is different alike in fabric and design from the painted ware encountered in Period IV. Herein the designs are mostly geometric and linear, consisting of parallel bands on the shoulder. Though not very abundantly represented, this pottery occurs throughout the occupation of Period V and well precedes the glazed ware.

The following types are illustrated:—

Plain pottery

Figs. 26-28

Type I. Bowl of dull-red ware with a sharpened knife-edged rim, a corrugated profile and a narrow flat base. Of fine fabric, it is devoid of any slip or wash. From an early level of Period V. It is a characteristic type of the Period and occurs abundantly throughout its occupation-strata. It is known also at Ahichchhatrā.[2] *Variant Ia* differs from the above in having distinctively thinner walls. Of medium fabric, it is treated with a wash. From a mid-level of Period V.

Type II. Shallow bowl of dull-red ware with a featureless rim and a grooved inner base. Of medium fabric, it is treated with a wash. From an early level of Period V. *Variant IIa* differs from the above in having a sharpened rim. Of medium fabric, it is treated with a wash. From a mid-level of Period V.

Type III. Bowl of dull-red ware with a thickened internally grooved rim, a corrugated profile and a shallow cup-like depression on the inner base. Of medium fabric, it is devoid of any slip or wash. From an unstratified layer of Period V. *Variant IIIa* differs from the above in having a featureless internally ledged rim. Of medium fabric showing mica-dusting, it is devoid of any slip or wash. From the latest level of Period V.

Type IV. Miniature vase of dull-red ware with an externally obliquely bevelled rim and a flat base. Of medium fabric, it is treated with a wash. From a mid-level of Period V.

Type V. Bowl of dull-red ware with a slightly everted and internally obliquely bevelled rim. Of medium fabric, it is treated with a wash. From a late level of Period V. *Variant Va* differs from the above in having an out-turned rim. Of medium fabric, it is treated with a wash. From a late level of Period V. *Variant Vb* differs from the above in having a vertical sharpened rim. Of medium fabric, it is treated with a wash. From an unstratified deposit of Period V.

Type VI. Bowl of dull-red ware with a vertical thickened rim, grooved at the top, and a convex base. Of medium fabric, it is treated with a slip on the inside and on the outside up to the hip only. From a late level of Period V.

[1] *Ancient India*, no. 1 (1946), p. 51, fig. 6, 65.

[2] *Ibid.*, p. 51, fig. 6, 70.

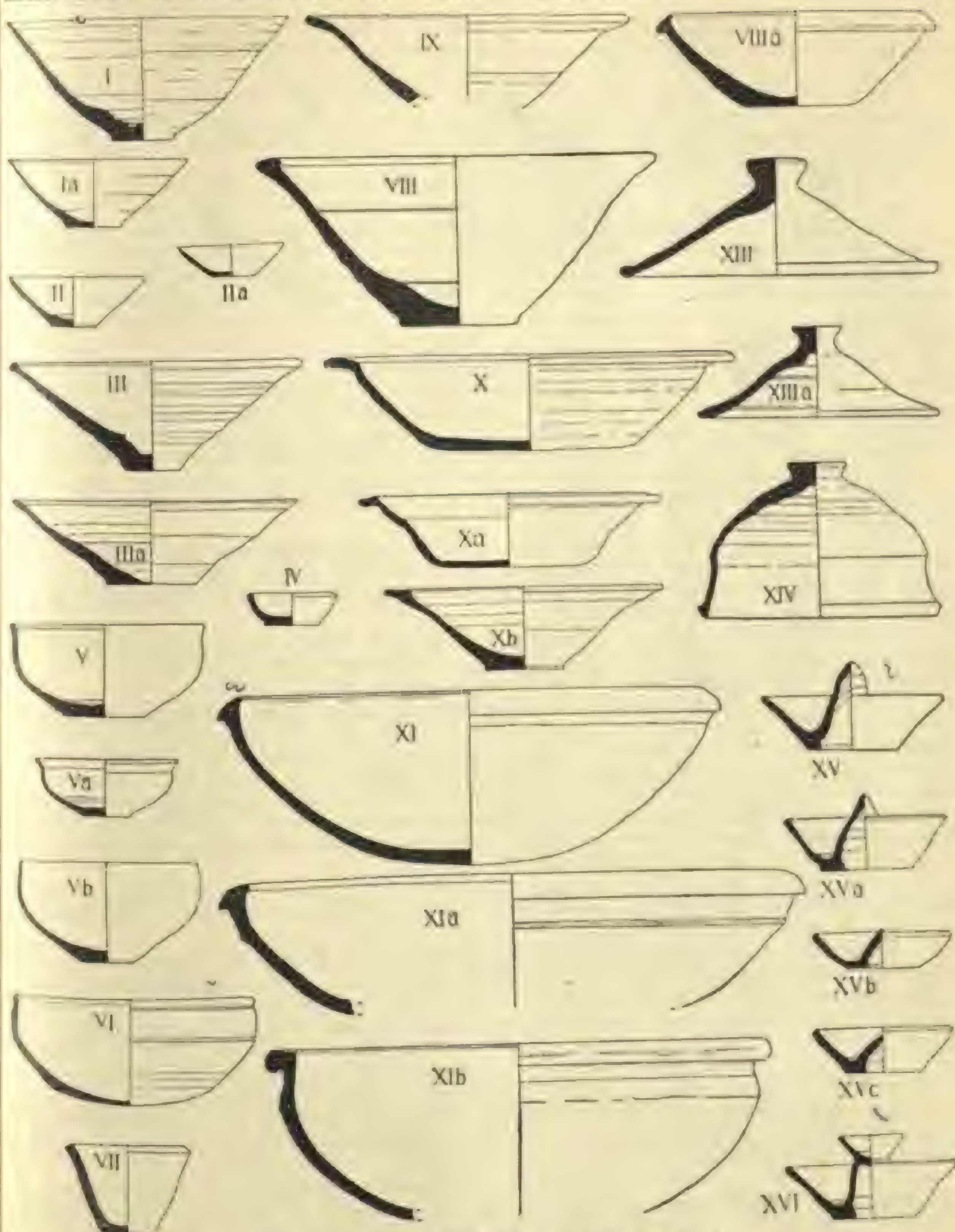


Fig. 26. *Pottery from Period V: plain pottery.* ¼

Type VII. Bowl of dull-red ware with an externally obliquely bevelled rim, consistently thick walls and a flat base. Of medium fabric, it is treated with a slip on the outside. From a mid-level of Period V.

Type VIII. Basin of red ware with an internally thickened and undercut rim and a flat thickened base. Of medium fabric, it is treated with a wash. From the latest level of Period V. *Variant VIIIa* differs from the above in having a nail-head rim and a thickened base. Of medium fabric, it is treated with a slip. From a mid-level of Period V.

Type IX. Bowl of darkish grey ware with a flared thickened rim and tapering walls. Of medium fabric, it is devoid of any slip or wash. From a late level of Period V.

Type X. Dish of dull-red ware with a horizontally splayed-out rim and a flat base. Of medium fabric, it is treated with a wash. From a mid-level of Period V. *Variant Xa* differs from the above in having a slight ledge on the inner side of the body. Of medium fabric, it is treated with a wash. From a mid-level of Period V. *Variant Xb* differs from the main type in having a thickened internally ledged rim and a narrow flat base. Of medium fabric, it is devoid of any slip or wash. From a late level of Period V.

Type XI. Basin of red ware with an oblique nail-head rim and a round base. Of medium fabric, it is treated with a slip. From an early level of Period V. *Variant XIa* differs from the above in having a prominent rib on the shoulder. Of medium fabric, it is treated with a wash. From a mid-level of Period V. *Variant XIb* differs from the main type in having a round-collared rim, ledged at the top, and a weak carination on the shoulder. From a mid-level of Period V.

Type XII. Basin of red ware with an oval-collared externally grooved rim and thick sides. It is distinguished by bold vertical incisions on the rim. Of medium fabric, it is treated with a wash. From a mid-level of Period V. (Fig. 27.)

Type XIII. Lid of dull-red ware with a thickened undercut rim-base and a flat terminal. Of medium fabric, it is devoid of any slip or wash. From a late level of Period V. *Variant XIIIa* differs from the above in having a more prominent terminal. Of medium fabric, it is treated with a wash. From a mid-level of Period V.

Type XIV. Lid of dull-red ware with an externally thickened and obliquely chamfered rim-base, a ledge on the body and a flat terminal. Of medium fabric, it is treated with a red slip both externally and internally. From an unstratified deposit of Period V.

Type XV. Lid of dull-red ware with a featureless rim and a hollow conical knob rising above the rim-level. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period V. *Variant XVa* differs from the above in having a more pronounced conical knob. Of medium fabric, it is treated with a wash. From an unstratified deposit of Period V. *Variant XVb* differs from the above in having the top of the central conical knob almost in level with the rim. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period V. *Variant XVc* differs from the main type in having the top of the central knob well below the rim-level. Of medium fabric, it is treated with a wash. From an early level of Period V.

Type XVI. Lid of dull-red ware, basically similar to the above type but having a shallow cup-like depression over the hollow conical central knob. Of medium fabric, it is devoid of any slip or wash. From a late level of Period V.

Type XVII. Incense-burner of red ware with a horizontally splayed-out featureless rim, a strap handle decorated with two incised lines and a hollow pedestal-base. Of medium fabric, it is treated with a bright-red slip. From an early level of Period V. *Variant XVIIa* differs from the above in having a sharpened drooping and ledged rim and a shallow conical receptacle in contrast to the flat one of the above. Of medium fabric, it is treated with a wash. From an early level of Period V.

Type XVIII. Miniature bowl with an everted featureless rim and a solid pedestal-base. Of medium fabric, it is devoid of any wash or slip. From a mid-level of Period V.

Type XIX. Closed lid of dull-red ware with a perforated finial. It has also a similar perforation on the side and a wider aperture at the base. Of medium fabric, it is treated with a wash. From a mid-level of Period V.

Type XX. Bowl of dull-red ware with a splayed-out featureless rim, a blunt carination at the hip and a rounded base. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period V. *Variant XXa* differs from the above in having a thickened and internally

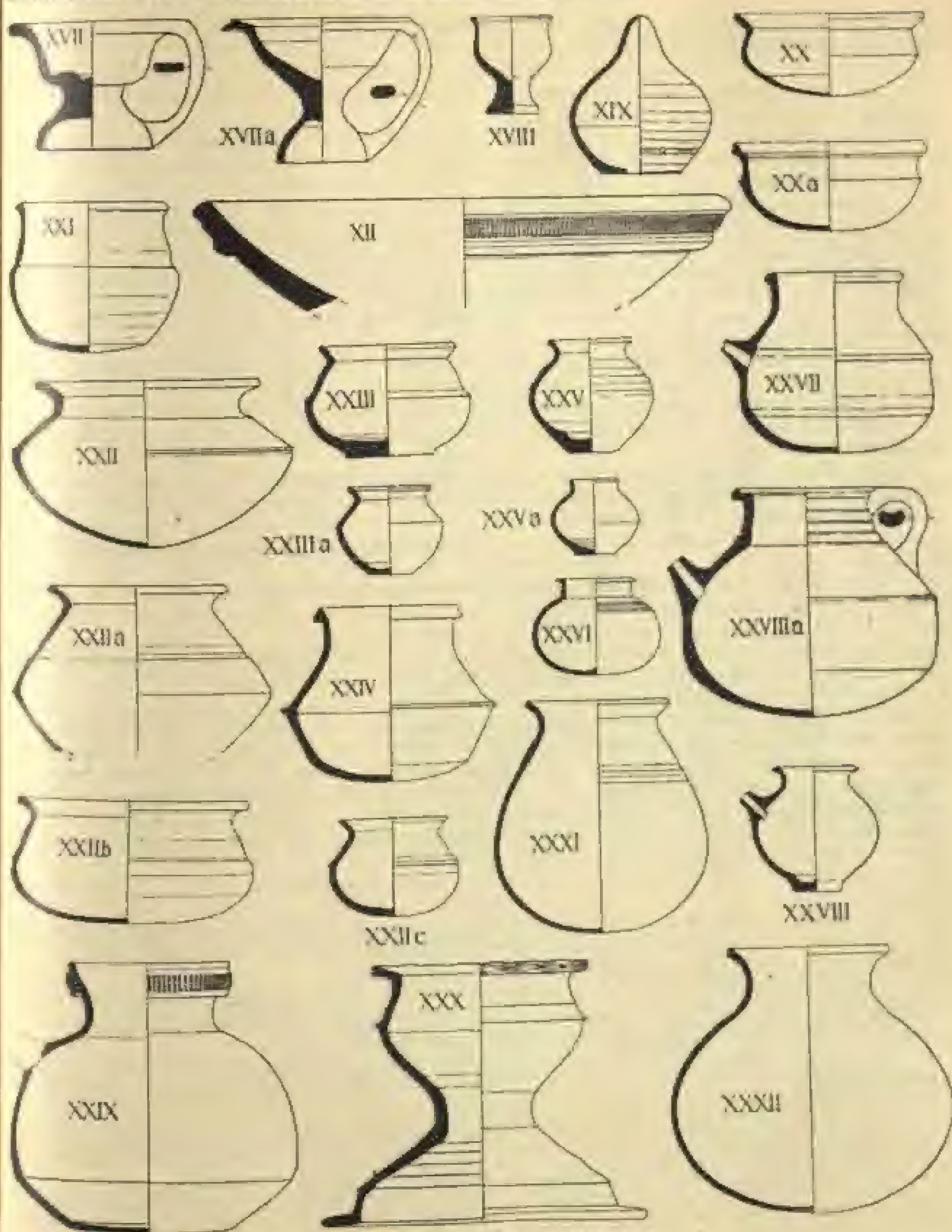


FIG. 27. *Pottery from Period V: plain pottery.* ¼

ledged rim, a prominently ribbed waist and a rounded base. Of medium fabric, it is treated with a wash. From a late level of Period V.

Type XXI. Vase of dull-red ware with an externally thickened rim, a prominently ledged waist and a convex base. Of medium fabric, it is treated with a red slip on the outside up to the waist only. From a late level of Period V.

Type XXII. Vase of red ware with a flared featureless rim, a concave neck, a ribbed waist and a rounded base. Of medium fabric, it is treated externally with a bright-chocolate slip up to the waist. From a mid-level of Period V. *Variant XXIIa* differs from the above in being deeper and has a grooved shoulder and a lower carinated girth. Of medium fabric, it is treated with a wash. From a mid-level of Period V. *Variant XXIIb* differs from the main type in not being carinated but having instead a ledge on the body and a flattish base. Of medium fabric, it is treated with a wash up to the ledge only. From a mid-level of Period V. *Variant XXIIc* differs from the above in having a rounded base. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period V.

Type XXIII. Vase of dull-red ware, indifferently fired, with a splayed-out rim, a carinated neck, a ledged body and a flat base. Of medium fabric, it is treated with a wash only. From a mid-level of Period V. *Variant XXIIIa* differs from the above in having a carinated body. Of finer fabric, it is treated externally with a slip up to the carination. From a mid-level of Period V.

Type XXIV. Vase of dull-red ware with an out-turned externally thickened and undercut rim, a low ribbed waist and a convex base. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period V.

Type XXV. Vase of dull-red ware with an out-turned featureless rim, a weakly corrugated shoulder and a thickened flat base. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period V. *Variant XXVa* differs from the above in having a vertical featureless rim and a plain shoulder. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period V.

Type XXVI. Vase of darkish-grey ware with a vertical clubbed rim, a shoulder decorated with oblique incisions, a rounded body and a flattish base. Of fine fabric, it is treated with a black slip on the outside. From a late level of Period V.

Type XXVII. Vase of dull-red ware with a vertical externally thickened rim, a straight neck and an imperfectly flat base. It is distinguished by a spout luted on the body. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period V.

Type XXVIII. Spouted vase of dull-red ware with an out-turned rim, a globular body and a button-base. The luting paste shows a lot of husk. Of medium fabric, it is treated with a wash. From an unstratified deposit of Period V. *Variant XXVIIIa* differs from the above in having a horizontally splayed-out nail-head rim, a grooved neck and a strap-handle in addition to the spout. Of medium fabric, it is treated externally with a red slip. From a mid-level of Period V.

Type XXIX. Spouted vase of red ware with an externally collared rim, which in turn is decorated with bold vertical incisions, a concave neck and a flat base. The spout-portion is broken. Of medium fabric indifferently fired, it is treated externally with a red slip. From an early level of Period V.

Type XXX. Stand of dull-red ware with a splayed-out rim, externally decorated with finger-tip decoration, a hollow stem and a horizontally splayed-out rim-base. Of medium fabric, it is treated with a wash. From an unstratified deposit of Period V.

Type XXXI. Pear-shaped vase of dull-red ware with an out-turned featureless rim and a rounded base. The lower portion has been beaten out to increase the girth. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period V.

Type XXXII. Vase of dull-red ware with an out-turned featureless rim, a globular body and a rounded base. Of medium fabric, it is devoid of any slip or wash. From a mid-level of Period V.

Type XXXIII. Vase of red ware with an out-turned oval-collared rim, a concave neck and a rounded body. Of medium fabric, it is treated externally with a red slip only up to the shoulder, below which there is a combing of gritty paste. From an early level of Period V.

Type XXXIV. Vase of red ware with a splayed-out featureless rim, internally grooved. Of medium fabric, it is treated with a red slip. The inside of the rim is distinguished by incisions. From a late level of Period V.

Type XXXV. Vase of dull-red ware with an outcurved rim, grooved externally, and having a prominent cordon, a narrow concave neck and a globular profile. Of medium fabric, it is treated with a red slip only up to the shoulder, below which is a combing of gritty paste. From an early level of Period V.

Decorated pottery

Fig. 28

Type XXXVI. Vase of red ware with an outcurved externally grooved rim which is decorated with a cord-design made by twisting at two opposite places of the rim. Of medium fabric, it is treated with a slip up to the shoulder which is also partially painted. From an early level of Period V. Sometimes the design takes the form of oblique incisions. This design done at two opposite places of the rim occurs at Ahichchhatrā as well.[1]

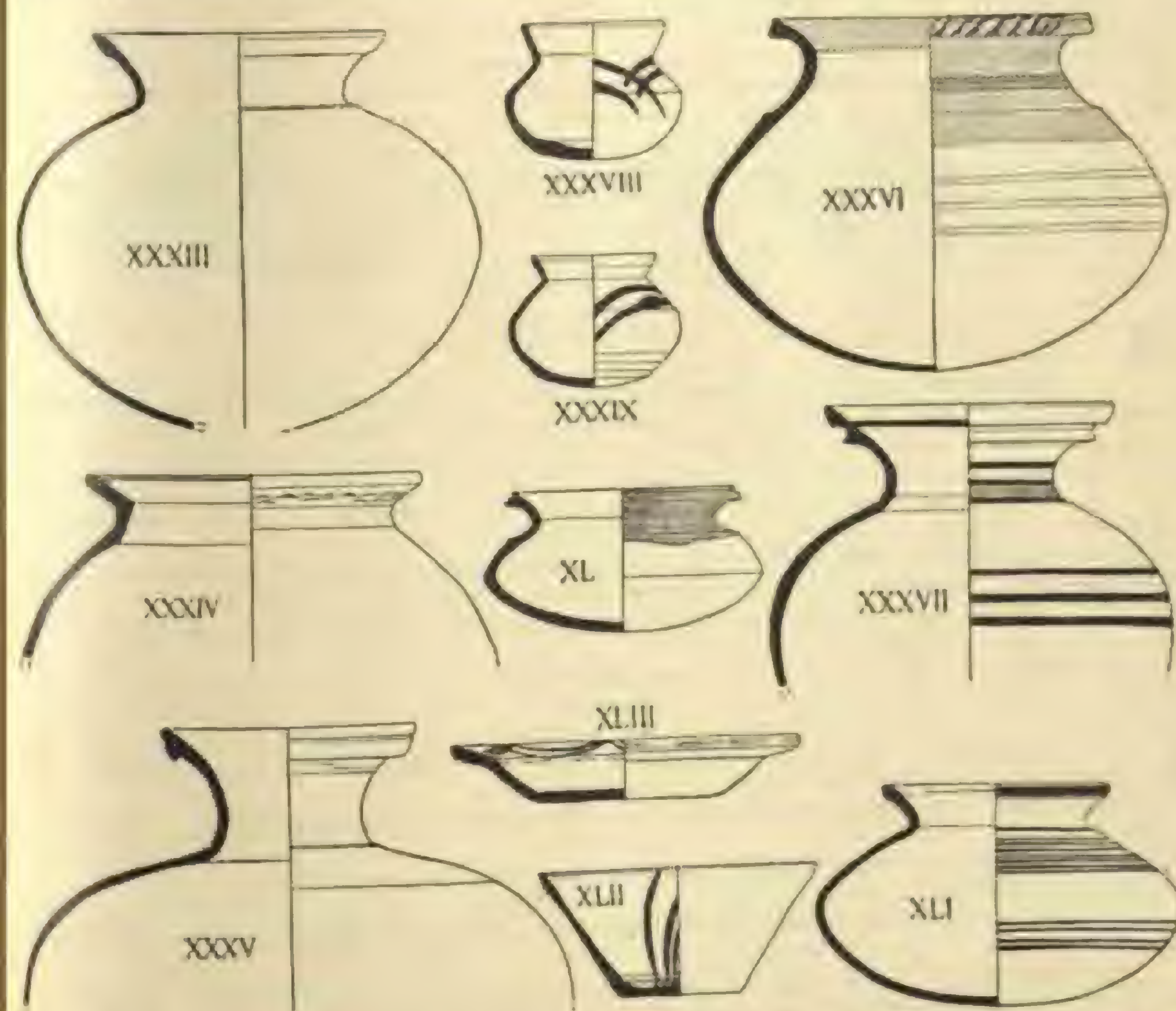


FIG. 28. *Pottery from Period V: XXXIII-XXXV, plain pottery; XXXVI-XLIII, decorated pottery.* ¼

[1] *Ancient India*, no. 1 (1946), p. 51, fig. 6, 65.

Type XXXVII. Vase of red ware with a splayed-out externally thickened rim, having a cordon below it, a narrow neck and a globular profile. Of medium fabric, it is treated on the outside with a red slip, upon which are painted in black horizontal bands on the neck and the body. From an early level of Period V.

Type XXXVIII. Vase of dull-red ware with an almost vertical featureless rim, an expanding neck, a weakly carinated profile and a thickened flattish base. Of medium fabric, it is devoid of any slip or wash but is painted instead with a pair of strokes crossing each other. From the latest level of Period V.

Type XXXIX. Vase of dull-red ware with an out-turned sharpened rim, a carinated neck, a globular profile and an imperfect flat base. Of medium fabric, it is treated with a wash and is painted in black with a pair of arched strokes. From the latest level of Period V.

Type XL. Vase of dull-red ware with a flared externally grooved and thickened rim, a concave neck, a ledged shoulder, a blunt carination at the waist and a rounded base. Of medium fabric, it is treated with a wash upon which is painted in black a thick irregular band on the shoulder. From an early level of Period V.

Type XLI. Vase of dull-red ware with an out-turned thickened rim, a ledge at the shoulder, a weakly carinated profile and a rounded base. Of medium fabric, it is treated with a wash upon which is painted in black a design consisting of horizontal bands on the rim, neck, shoulder and body. The base is marked by the presence of soot. From an early level of Period V.

Type XLII. Bowl of dull-red ware with a thin sharpened rim and sides tapering to a flat base. Of medium fabric, it is treated with a wash and is painted in black on the inside with three equally-spaced groups of strokes converging towards the centre of the base. From a mid-level of Period V.

Type XLIII. Plate of dull-red ware with a splayed-out rim, externally grooved and a flat base. Of medium fabric, it is treated internally with a thin slip, over which is painted in black a design consisting of loops on the rim. From a mid-level of Period V.

Pl. XXXV

1. Fragment of a vase of red ware, decorated with a moulded design of dots in a panel below loop, etc. It is dusted over with mica. From a mid-level of Period V.

2. Fragment of a vase of red ware, decorated with a moulded design in panels of creeper, bold lines and dots. It is dusted over with mica. From a late level of Period V.

3. Fragment of a vase of red ware, decorated with an impressed design of chequer-pattern. The squares are filled in with mica. From a mid-level of Period V.

4. Fragment of a vase of terracotta red ware decorated on the interior with an incised pattern showing leaves, etc. From a mid-level of Period V.

5. Rim-fragment of a plate decorated with an incised decoration consisting of lines converging to a point. From a late level of Period V.

6. Fragment of a vase of dull-red ware decorated with a moulded design of creeper. It is dusted over with mica. Finger-impressions are clearly visible on back. From a mid-level of Period V.

7. Fragment of a vase of red-slipped ware decorated with groups of incised lines depicting a wavy pattern. From an unstratified deposit of Period V.

8. Fragment of a *chilam*-like pot of red ware decorated on the outside with incised lines. From a late level of Period V.

9. Fragment of a vase of red-slipped ware decorated with an incised design showing loops. From an unstratified deposit of Period V.

10. Neck-fragment of a vase of red-slipped ware, painted in black with horizontal bands, from one of which short oblique strokes also emerge. From an early level of Period V.

11. Fragment of a vase of red-slipped ware, painted in black with horizontal bands, one of which also shows loops joined to it. From an early level of Period V.

12. Rim-fragment of a vase of greyish ware decorated on the rim-point with notches. From a late level of Period V.

13. Base-fragment of a vase of greyish black ware decorated with impressed designs of circles with spokes. From a mid-level of Period V.

G. Other finds[1]

(i) *Terracotta figurines*

1. Human figurines.—The excavation yielded thirtythree human figurines which came variously from Periods III, IV and V. Periods I and II did not yield any human figurine.

In all these periods hand-modelled specimens have been found together with moulded figurines, but a large majority of figurines in Period V is modelled by hand, whereas the number of cast figurines is only two. Cast figurines, however, seem to have attained a degree of perfection in Period IV wherein the figure of Bodhisattva Maitreya (pl. XXXVIII), the male torso with elaborate drapery (pl. XXXIX, 8) and the bust of a female figure (pl. XXXVII A) are truly specimens of finished art. In Period V the figures present poor workmanship and the images, for the most part, remain crude. In every period, the female figures outnumber the male ones, and the representation of women sporting with parrots or swans seems to have been a feature of the late levels of Period III and the early levels of Period IV. This subject is often met with in sculpture and literature. It seems likely that a common tradition of *nāyikās* sporting with parrots or swans as a familiar theme was drawn upon by the classical writers, the sculptors and the authors of these terracottas. Mention may be made of the occurrence of a figurine in Period III having a human head and an animal's body (pl. XXXVI, 3). The conception of *vyālas* as anthropomorphic figures, to which evidently the above figure refers, was a popular subject with writers and sculptors alike. From one of the lower levels of Period V comes an interesting plaque with standing figures of a man and a woman (pl. XLI, 23). A large number of such specimens have been recovered from Stratum I of Ahichchhatrā excavations, ascribable to *circa* A.D. 800-1100. A votive purpose is assigned to these plaques, which were used as offerings near *satī* stones at places called *satī-chaurā*.[2]

The following specimens are illustrated:—

Pls. XXXVI, XXXVII A and XXXVIII-XLI

1. Standing female figurine, moulded. The elaborate head-dress consists of rosettes, with ribbons attached to them. *Kuṇḍalas* for ears and a heavy round necklace are the ornaments displayed on the body. The image holds a flower in its left hand and a bowl in the right. From a late level of Period III. (HST 1-740.)

2. Torso of a standing female figurine, moulded. The left hand rests on the slender waist, while the right holds a bunch of fruits. The drapery consists of a flowing lower garment. A very striking feature of the figurine is the representation of the parrot seated on the left arm. It was a favourite subject of the classical writers and sculptors of Mathurā of the early Christian centuries. From a late level of Period III. In the features of its lower portion including the peculiar flowing garment the image is somewhat akin to some specimens available from Bijak-ki-Pahāṛī, Bairāṭ (Jaipur).[3] (HST 1-487.)

3. Fragment of a hand-modelled figurine of an apparently mythical being with a human face and an animal body. Eyes are indicated by incised circlets enclosed within lozenges. The chin is shown pointed by pinching the portion below the mouth. The transverse hole in the neck is

[1] The sections on terracotta figurines, stone images, other stone objects, bangles and rings have been contributed by Shri K. K. Sinha.

[2] V. S. Agrawala, 'Terracotta figurines of Ahichchhatrā, District Bareilly, U.P.', *Ancient India*, no. 4 (1947-48), p. 178.

[3] D. R. Sahni, *Archaeological Remains and Excavations at Bairat*, pl. V, c and d.

evidently for fastening a string. Another prominent feature is that the entire body is covered with punched circlets, mostly enclosed between grooved lines. From a late level of Period III. (HST 1-488.)

4. Fragment of a hand-modelled female figure from waist to foot. On its prominent hips is displayed an elaborate broad jewelled girdle formed by four rows of punched circlets, alternating with grooved lines. From a mid-level of Period III. Similar specimens have been recovered from Ahichchhatrā (Stratum VIII), where they have been classified under the type representing Mother Goddess, the figures wherein seem to conform to a predetermined iconographic pattern, punched decoration being an outstanding feature.[1] (HST 1-1209.)

5. Head of a human figurine, moulded in the round, having an elaborate head-gear. From a late level of Period III. (HST 1-903.)

6. Upper part of an artistically moulded plaque of a female figurine. The bent arms are half-raised with the palms held frontally. The hair is parted in the middle and turned sideways. The striking feature of the image consists in its luxurious ornamentation. Besides having an elaborate coiffure consisting of flowers, pearls and ribbons, the image wears a pair of heavy *kundalas* with rosette-designs. Other ornaments on the body include a necklace, a thick torque, bracelets and bangles. A bird, probably a swan, is shown seated on the right arm and pecking at a foliage. From an early level of Period IV. (HST 1-809.)

7. Sculpturesque torso of Bodhisattva Maitreya, holding the traditional *kuṇḍikā* in his left hand, while the right one is raised and the palm outstretched in *abhaya-mudrā*. The treatment of the dress is as follows. The *uttarīya* (scarf), thrown over the left shoulder, covers the left arm and passing round the right leg emerges beneath the knee and finally rests on the left fore-arm. The lower garment, a *dhotī*, with its ample folds hanging between the legs is fastened round the loins by means of a rolled scarf which is knotted over the right thigh. The figure is wearing a necklace made of a band of rosettes and has a bracelet on the right arm. From a late level of Period IV. In all its details, the figure is similar to the sculptures of Mathurā and Ahichchhatrā[2] of the early second century A.D., to which period the present image is also assignable. The importance of the figure lies in the fact that features typical of stone sculptures have been faithfully rendered here in terracotta. (HST 1-41[illegible] and 431.)

8. Torso of a standing male figurine moulded in the round. Both the arms are placed on the waist. The figure is wearing a round necklace inlaid with precious stones and having a pendant. The image is outstanding for the rich treatment of its drapery which includes a *dhotī* with vertical folds, tied round the waist. On the shoulders is a scarf, the oblique folds of which cover both the arms. The upper portion of the body is left practically bare excepting for the *vastra-yajñopavīta* placed diagonally between the waist and left shoulder. The background on either side of the legs suggests the scales of a snake. From an unstratified deposit of Period IV. (HST 1-117.)

9. Left arm of a hand-modelled human figure holding a bowl. From a late level of Period IV. (HST 1-68.)

10. Left foot of a human figurine. It has been moulded naturalistically and with suppleness. From an early level of Period IV. (HST 1-850.)

11. Lower portion of a standing male figure. From an early level of Period IV. (HST 1-9[illegible].)

12. Grotesque figure of a seated being modelled by hand. The ridge-like nose has been formed by pinching the cheeks. Other features of the figure include applied eyes and a pellet of clay applied on the head to indicate either *śikhaṇḍa* or a head-wear. From a mid-level of Period IV. (HST 1-822.)

13. Squatting male figure crudely modelled by hand. From a late level of Period IV. (HST 1-413.)

14. Head, modelled by hand, with locks of hair shown by incised lines. An incised oval design at the slightly concave top may indicate *śikhaṇḍa*. The nose has been formed by pinching the

[1] Agrawala, *op. cit.*, pp. 106-07 and pl. XXXI A.

[2] J. Ph. Vogel, *Catalogue of the Archaeological Museum at Mathura* (Allahabad, 1910), pl. XV b. At Ahichchhatrā an exactly similar red sandstone image of Bodhisattva Maitreya was found. It is displayed in the National Museum of India, New Delhi.



Terracotta figurines, Period III (see page 83)

To face plate XL



Terracotta human figurines, Period IV (*see page 84*)



Terracotta human figurines, Period IV (see page 84)

To face page 85



Terracotta human figurines, Period V (see pages 84 and 85)

sides near the two eyes. The mouth is indicated by a hollow made below the nose. *Kuṇḍalas* and a round necklace, both in appliqué, form the ornaments. From an early level of Period IV. (HST 1-751.)

15. Upper part of a standing female figure. The elaborate head-dress consists of a rosette placed in the middle. Ornaments of the body include a triple pearl-fringe on the forehead, round *kuṇḍalas*, a necklace and torque consisting of three strands. From an early level of Period IV. (HST 2-19.)

16. Moulded plaque of a couple with elaborate head-dresses. From a late level of Period IV. (HST 1-624.)

17. Male figure irregularly modelled by hand. Eyes indicated by piercing holes on both sides of the ridged nose and mouth by incision. On the head there is a rosette which may form part of the head-dress. Hands and feet missing. From an early level of Period IV. (HST 1-492.)

18. Bust of a female figurine with prominent breasts and out-stretched arms. The figure is wearing armlets. Eyes and mouth have been crudely formed by incised lines, and so also the applied *śikhaṇḍa* at the crest. From an early level of Period IV. (HST 1-686.)

19. Torso of a male figurine modelled by hand. The upper front of the body is covered with pin-holes and has a deep socket for the head in the neck. From a late level of Period IV. (HST 1-393.)

20. Male figurine crudely modelled by hand. The image is wearing an elaborate necklace composed of two bands of circlets. Armlets on the arms are the other ornaments on the body. From an unstratified deposit of Period V. (HST 1-1090.)

21. Moulded plaque of a male figure with an elaborate head-wear. The image is wearing a round necklace and a pendant ear-ornament. The right arm is placed on the right chest, probably in *abhaya-mudrā*. The figure may be a Jaina image. From a late level of Period V. (HST 1-452.)

22. Crude female figurine, modelled by hand, having breasts and nose in appliqué. Eyes, mouth and the palms are formed by pinching. From an early level of Period V. (HST 1-775.)

23. Thin plaque showing standing figures of a man and a woman. From an early level of Period V. (HST 1-356.)[1]

24. Thin plaque of a standing female figure. From an early level of Period V. (HST 2-22.)

II. ANIMAL FIGURINES.—The excavation yielded one hundred and five animal figurines which are all hand-modelled. Period V has the largest number of animal figurines. Period I is devoid of any terracotta material. The occurrence of three animal figurines (pl. XLII A) from the levels associated with Painted Grey Ware is remarkable for the reason that no figurines of such an antiquity as these other than those belonging to the protohistoric chalcolithic cultures are available to us. Crudely modelled in ordinary terracotta colour, these figurines do not reveal any craftsmanship in the art of clay-modelling which is noticeable in the specimens of the later periods.

With the exception of four specimens, the animal figurines of Period III consist only of elephants. In Period IV, the majority of figurines consists of humped bulls. Period V presents a greater variety of subjects which include horses, rams, bulls and the like.

In Period III the figurines are generally well-modelled, and a favourite device of decorating the body of elephants in this period is to cover it with circlets which are either punched, stamped, pierced or notched, but still more artistic are the elegant *chakras* and leaves which are stamped on the body and the temples of the elephants (pl. XLIII, 4, 7, 9 and 10). In Period IV as well, the figurines, particularly the bulls, reflect skill and imagination in their modelling. But in Period V, though the number of figurines is quite considerable, in most cases the specimens are fragmentary and crudely modelled. The many stylized horse figurines in this period present a longish neck sometimes with beaked faces.

[1] Cf. Agrawala, *op. cit.*, pl. LXX, 327.

The following specimens are illustrated:—

Pls. XLII A and XLIII-XLV

1. Fragment of a humped bull. From a late level of Period II. (HST 1-1578.)

2. Fragment of a crudely modelled figurine, perhaps a bull. From the accumulation following the erosion (HST 1-1368.)

3. Fragment of an animal figurine, probably a horse. Transverse hole might indicate the nose. From the accumulation following the erosion.[1] (HST 1-1108.)

4. Fragment of an elephant. Tusks have been shown coming out of their root-sheaths, which are indicated by a thin coating of clay applied round the tusk at the joints. Eyes are formed by pierced holes within incised lozenges. From an early level of Period III. (HST 1-854.)

5. Fragment of an animal figure. Transverse holes in the legs indicate that it was intended to be used as a wheeled toy. From a late level of Period III. (HST 1-1212.)

6. Head of a horse. Teeth have been indicated by indentations placed on the portion brought into relief by pinching. Manes have been shown rather prominently by pinching. Transverse hole above the nose is for fastening the string. The figure presents a detailed study of anatomical features. From a mid-level of Period III. (HST 1-626.)

7. Head and trunk of a nicely modelled elephant. Three parallel lines of pierced circlets run on the forehead. From a late level of Period III. (HST 1-908.)

8. Tusk of an elephant. The applied cord-like thing encircling the tusk may indicate its root-sheath or string fastened with the tusk. From an early level of Period III. (HST 1-1052.)

9. Side-portion of an elephant. The decoration consists of lines of punched circlets and also the motif of the impressed *chakra* and leaf. From a late level of Period III. (HST 1-874.)

10. Forehead of an elephant. Decorative design consists of an impressed *chakra* coming in between two leaves which are also impressed. Eyes indicated by encircled dots within lozenges. From an early level of Period III. (HST 1-105.)

11. Fragment of an unfinished lion in dark grey fabric. The manes around the face have been indicated prominently. From an early level of Period III. (HST 1-1313.)

12. Figure of a stylized elephant with grotesque features consisting of longish ears, applied tusks and notched circlets on the forehead. From a mid-level of Period III. (HST 1-1244.)

13. Crudely modelled figure of some indeterminate animal with longish ears and rounded face. On the hind portion can be seen a group of punched circlets. From an early level of Period IV. (HST 1-551.)

14. Fragment of a humped bull. The body is covered with intersecting lines of pin-holes. From a late level of Period IV. (HST 1-470.)

15. Head of a ram figurine. Eyes shaped by chipping the portion below the forehead, thus bringing the two eyes into relief. Horns missing. From an early level of Period IV. (HST 1-500.)

16. Head of an animal figure, perhaps a ram. From a mid-level of Period IV. (HST 1-1100.)

17. Small figure of a humped bull. The entire body is covered with pin-holes. From an early level of Period IV. (HST 1-840.)

18. Head of a crocodile. From a late level of Period IV. (HST 1-710.)

19. Fragment of a boar figurine with a protruding mouth having an applied lower lip. From a late level of Period IV. (HST 1-485.)

20. Small figure of a nicely modelled humped bull with an applied twisted tail. Transverse hole through the neck is evidently for fastening a string. Dark-grey fabric. From a late level of Period IV. (HST 1-661.)

21. Fragment of an animal figure, perhaps a humped bull, with a twisted tail. Head and hump missing. From an early level of Period IV. (HST 1-1095.)

22. Fragment of a horse figurine. Manes have been prominently indicated by indentations placed on the exaggerated neck. Part of the applied bridle is resting on the forehead. The main body is hollow. From a late level of Period V. (HST 1-381.)

---

[1]Since this accumulation well-preceded the deposit of Period III, it is reasonable to assume that the figurine originally belonging to Period II.



A. *Terracotta animal figurines, Period II (see page 86)*



B. *Terracotta votive tank, Period IV (see page 87)*



Terracotta animal figurines, Period III (see pages 85 and 86)



Terracotta animal figurines, Period IV (see page 86)



Terracotta animal figurines, Period IV (see page 86)

23. Fragment of a ram figurine with applied eyes. The animal is represented as wearing some sort of applied ornament round the neck. Pierced transverse holes above the mouth indicate the nose. From a mid-level of Period V. (HST 1-385.)

24. Hand-modelled figurine of a horse. Eyes have been indicated by a dot within incised lozenges. The applied bridle is very elaborate in details. From a late level of Period V. (HST 2-12.)

25. Head of a stylized horse figurine with slightly beaked face and having applied eyes and manes prominently displayed on the neck. Unstratified. (HST 1-475.)

26. Fragment of an animal figure with rider. The animal is shown as trotting. Applied and rounded eyes on a protruding face are the other features. Head of the rider is broken. From an early level of Period V. (HST 1-468.)

27. Fragment of an animal figurine having an applied tail which is twisted. From an upper level of Period V. (HST 1-366.)

28. Fragment of a crudely modelled bull figurine. Hind legs have been shown as slanting. This and similar other specimens are different from the bull figurines from the earlier strata described above. The latter are much more skilfully modelled than those of the Period V. From a late level of Period V. (HST 1-569.)

(ii) *Miscellaneous terracotta objects*

Besides terracotta figurines described above, a large number of household objects and other finds of terracotta were recovered from the excavation at various levels. It may be repeated that Period I is devoid of any material falling under this group. These objects include votive tanks, discs, flesh-rubbers, seals, dabbers, spindle-whorls, etc.

Votive tanks.—The excavation yielded about half a dozen votive tanks, all of which came from Period IV. The votive tanks are found at other sites in northern India, e.g. Taxila[1] and Ahichchhatrā[2]. At the latter site, their first introduction is dated round A.D. 100-200. They are foreign in origin, attributed to the Parthians and said to be associated with the cult of Great Mother Goddess.[3]

The following specimens are illustrated:—

Pl. LII B

1. Fragment of a votive tank, crudely modelled by hand. It consists of a fragmentary walled enclosure and figure, evidently a musician, wearing a notched collar and represented as playing on a pair of cymbals. From a mid-level of Period IV. A large number of such musician-types occurring separately and also forming part of votive tanks have been recovered from Stratum IV of Ahichchhatrā (A.D. 100 to 350).[4] (HST 1-733.)

Pl. XLII B

2. Fragment of the walled enclosure of a votive tank, with a bird on the rim. From an early level of Period IV. Votive tanks with birds on their rims are also available from Ahichchhatrā.[5] (HST 2-20.)

Discs.—A large number of discs, including pottery discs and belonging to different periods, was recovered from the excavation. These for the major part are simple,

[1] 'Explorations at Sirkap', *An. Rep. Arch. Surv. Ind.*, 1924-25, p. 50; A. Ghosh, 'Sirkap', *Ancient India*, no. 4 (1947-48), p. 78 and pl. XVII.

[2] Agrawala, *op. cit.*, p. 125.

[3] *Ibid.*

[4] *Ibid.*, pls. XXXVIII and XXXIX.

[5] *Ibid.*, p. 126.

but the edges are generally decorated. They were evidently meant to be used as gaming counters.

The following specimens are illustrated:—

Pl. XLVI

1. Disc with decorated edge. From a late level of Period II. (HST 1-1430.)

2. Disc with star-shaped decoration round the edge made by notching. Unstratified. (HST 1-212.)

3. Disc with floral design on the one side and *swastika* incised on the other. From a mid-level of Period III. (HST 1-604.)

4. Disc with double perforations, made of a sherd of grey ware with black slip on the outside. From an early level of Period II. (HST 1-1556.)

5. Disc with rows of pin-holes round the edge. From an early level of Period IV. (HST 1-1082.)

6. Disc with decorated edge. From the accumulation following the erosion. (HST 1-1499.)

7. Disc with decorated edge. From an early level of Period II. (HST 1-1312.)

8. Disc bearing a figure of tortoise on one side. From a late level of Period IV. (HST 1-409.)

9. Disc with decorated edge. From an early level of Period II. (HST 1-1548.)

10. Perforated disc made of a sherd of Painted Grey Ware. From an early level of Period II. (HST 1-1519.)

11. Disc with decorated edge. From the accumulation following the erosion. (HST 1-1305.)

Dabbers and flesh-rubbers.—The following specimens are illustrated:—

Pl. XLVII

1. Dabber with a solid handle. From an early level of Period V. (HST 1-145.)

2. Dabber with a solid handle. The hole in the handle is evidently for inserting a rod. From an early level of Period V. (HST 1-377.)

3. Conical dabber. From a mid-level of Period V. (HST 1-55.)

4. Rectangular flesh-rubber. From an early level of Period III. (HST 1-1139.)

5. Square flesh-rubber. Unstratified. (HST 1-808.)

Wheels, toy-cart, etc.—The following specimens are illustrated:—

Pl. XLVIII

1. Plano-convex wheel with star-shaped design impressed on one side. From an early level of Period IV. (HST 1-926.)

2. Wheeled toy-cart. The hole at the yoke-end of the cart is for fastening a string to run the cart. From an early level of Period IV. (HST 1-1136.)

3. Double-convex wheel. The spokes of the wheel are indicated on both sides. From a late level of Period IV. (HST 1-141.)

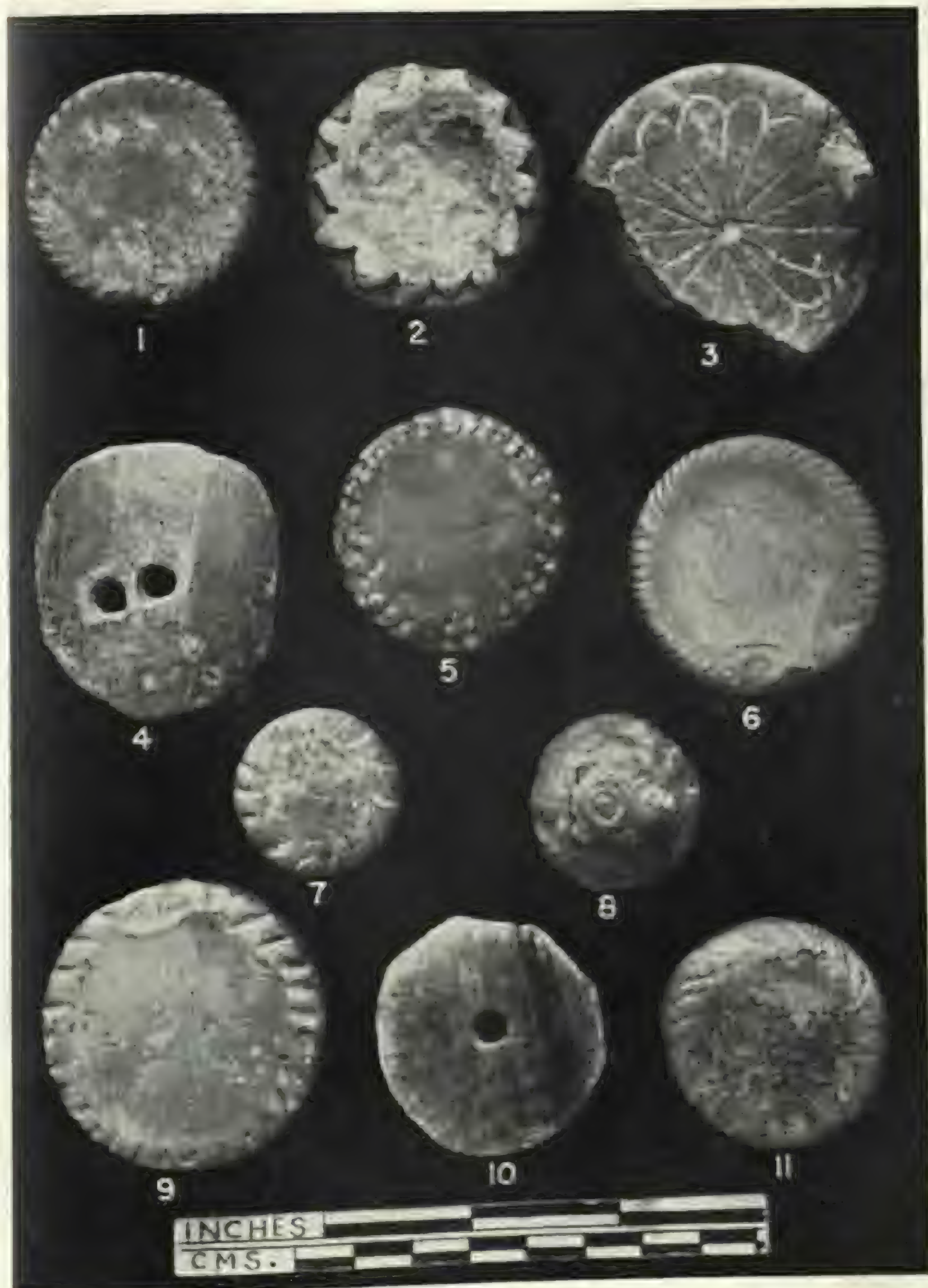
4. Wheel with impressed spokes on one side and an impressed design of a lotus on the other. From an early level of Period IV. (HST 1-1133.)

5. Double-convex wheel. From a late level of Period IV. (HST 1-79.)

6. Wheel with some notched design, probably floral. From a mid-level of Period IV. (HST 1-432.)

7. Fragment of a circular object with an impressed design on one side. From a late level of Period IV. (HST 1-527.)

8. Fragment of a circular object with friezes of incised motifs running within concentric circles one side and incised decoration formed by criss-cross lines on the other. From an early level of Period V. (HST 1-869.)



Terracotta discs: 1, 4, 6, 7, and 9-11, Period II; 2, unstratified; 3, Period III; 5 and 8, Period IV (see page 87)



Dabbers and flesh-rubbers: 1-3, Period V; 4, Period III; 5, unstratified *(see page 88)*



Wheels, toy-carts, etc.: 1-7, Period IV; 8, Period V (see page 88)



Miscellaneous terracotta objects: 1, 8, 13, 14 and 17, Period V; 2, 5-7, 12 and 15, Period IV; 3 and 10, Period III; 4, unstratified; 9, 11 and 16, Period II (see pages 88 and 89)



Stone objects: 1, 4, 6-8, 10 and 12, Period IV; 2, 5 and 11, Period II; 3, Period III; 9, unstratified (see pages 89 and 90)



A. *Fragment of sandstone rotary quern, Period IV (see page 90)*



B. *Architectural fragment of sandstone, Period V (see page 90)*



A. *Stone image of Rishabhadeva, Period V* (*see page 90*)



B. *Terracotta votive tank, Period IV* (*see page 87*)

OTHER OBJECTS.—The following specimens are illustrated:—

Pl. XLIX

1. Potter's stamp for impressing net-design. From a mid-level of Period V. (HST 1-120.)
2. Stopper (?) with a lozenge-shaped handle. From a late level of Period IV. (HST 1-896.)
3. Gamesman. From an early level of Period III. (HST 1-876.)
4. Potter's stamp with a pedestal-shaped handle. Unstratified. (HST 1-14.)
5. Rectangular slab bearing impressions of *chakras* on both sides. From a mid-level of Period IV. (HST 1-405.)
6. Reel. One of its ends is slightly concave. From an early level of Period IV. (HST 1-1016.)
7. Reel with a perforation in the middle and concentric circles at the two ends. It has been taken out of a nice mould. From an early level of Period IV. (HST 1-761.)
8. Spindle-whorl. From a late level of Period V. (HST 1-38.)
9. Feeding cup of grey ware with a loop-handle. From an early level of Period II. (HST 1-931.)
10. Seal-impression. From a late level of Period III. (HST 1-913.)
11. Cone-shaped pendant with perforation. From a late level of Period II. (HST 1-930.)
12. Spindle-whorl with grooved lines. From an early level of Period IV. (HST 1-1355.)
13. Net-sinker. From an early level of Period V. (HST 1-388.)
14. Semicircular potter's stamp. From a mid-level of Period V. (HST 1-65.)
15. Stopper with a knob-handle. The low conical bottom helping a spiral movement may suggest its employment as a toy. Its wooden replica is a favourite toy for children even today. From an early level of Period V. (HST 1-984.)
16. Conical seal. From the accumulation following the erosion. (HST 1-1107.)
17. Potter's stamp bearing star-shaped design in the centre and bands of other motifs running in concentric circles. From an early level of Period V. (HST 1-352.)

(iii) *Stone images*

The site was not rich in its yield of stone images. Only three specimens were recovered, all of which came from Period V and are illustrated here.

Pl. XXXVII B

1. Lower portion of a soapstone figure, perhaps male. The left arm rests on the hip and the figure wears an elaborate girdle of more than three strands, with a prominent facing. Of the dress, only lower folds of the *uttarīya* are available and the lower garment, evidently a *dhotī*, has its folds coming down between two legs. From an early level of Period V. (HST 1-650.)

2. Sandstone plaque of a standing female figurine with a slender waist. The figure stands on some animal, evidently a *vāhana*, and her left arm rests on water-pots. The seated figure of Gaṇeśa on the left top helps us in identifying the image as a representation of Gaurī.[1] From an unstratified deposit of Period V. According to the *Rūpamaṇḍana*,[2] such a sculpture represents the Pārvatī aspect of Gaurī, meant essentially for household worship. Besides an alligator as *vāhana* shown below her feet, she carries in her hand water-pot, Gaṇeśa and possibly a mirror and *liṅga*—the latter two might have occurred on the right side which is defaced. (HST 1-370.)

[1] I am indebted to Shri T. N. Ramachandran for the identification of this image. According to him such a representation is common in Bengal.

[2] Certain passages of the *Rūpamaṇḍana* have been quoted by T. A. Gopinatha Rao in his *Elements of Hindu Iconography*, I, pt. II, Appendix C, p. 120. The relevant passage is translated as follows: 'The goddess that has rosary, Śiva-*liṅga*, image of Gaṇeśa and water-pot in her hands and is placed between two pyres of fire is called Pārvatī. The image having the rosary, lotus, *abhaya* and *vara* and occupying a seat of an iguana should always be worshipped in the house for prosperity.'

Pl. LII A

3. Sandstone image in relief of the first Jaina Tîrthankara Rishabhadeva in *dhyāna-mudrā*. Though the upper portion including the head is not available, the leaf on the carved upper left side, which is that of a traditional *aśoka* tree, would make the figure that of Rishabhadeva.[1] From the latest level of Period V. (HST 1-729.)

(iv) *Other stone objects*

Pls. L and LI

1. Fragment of a sandstone pestle. From a late level of Period IV. (HST 1-711.)
2. Whetstone of slate. From a late level of Period II. (HST 1-1469.)
3. Fragment of a sandstone pestle. From an early level of Period III. (HST 1-1473.)
4. Casket-lid of steatite with incised floral design on the outer surface. From a late level of Period IV. (HST 1-845.)
5. Chert weight. From a late level of Period II. (HST 1-1427.)
6. Fragment of a steatite casket-lid. Incised design of lotus on the outer surface. From an early level of Period IV. (HST 1-439.)
7. Casket-lid of steatite with a knob-handle, having an incised design on the outer surface. From a late level of Period IV. (HST 1-421.)
8. Fragment of a steatite casket-lid with a knob-handle. From an unstratified deposit of Period IV. (HST 1-1046.)
9. Chessman or perhaps an ear-ornament of steatite with concentric circles. Unstratified. (HST 1-369.)
10. Fragment of a lid of steatite. Incised motif of leaf and criss-crosses. From an early level of Period IV. (HST 1-1064.)
11. Weight of red jasper. From an early level of Period II. (HST 1-373.)
12. Fragment of a casket-lid of chalcedony. From a late level of Period IV. (HST 1-1236.)
13. Fragment of a rotary-quern of sandstone. From a late level of Period IV. (HST 1-1588.)
14. Star-shaped architectural fragment of sandstone. From a late level of Period V. (HST 1-126.)

(v) *Bangles*

Bangles were recovered from various levels. Glass bangles are the largest in number. They come mostly from Period V. Most of these are opaque, but some are translucent. A very familiar device of decorating these bangles has been to place tiny studs round the outer edge. The use of stratified glass is also common. The occurrence of glass bangles (above, p. 13, n. 2) in Period II is noteworthy. Evidence of glass bangles being in use in so remote a past is not available.

Next in order of frequency as bangle-material comes terracotta. Terracotta bangles had been in use in Periods III, IV and V. The other materials used for bangles include copper, shell, ivory, agate and bone.

The following specimens are illustrated :—

Pl. LIII

1. Fragment of a bangle of light brown glass, triangular in section. From a mid-level of Period II. (HST 1-1446.)

[1] Identified by Shri T. N. Ramachandran.



Bangles: 1 and 2, Period II; 3-5, Period III; 6, Period IV; 7, 12 and 17, unstratified; 8-11, 13-16 and 18-22, Period V (see pages 90 and 91)



A. *Finger-rings: 1-3, Period III; 4-7, Period IV; 8, Period V (see page 91)*



B. *Copper bowl, Period V (see page 97)*



Beads: 1, 15, 17 and 24, Period IV; 3, 4, 7, 8, 11-14, 16, 18-20, 22, 28 and 30, Period III; 5 and 6, unstratified; 2, 9, 25-27, 29 and 31, Period II; 10, 21 and 23, Period V (see pages 93 and 94)



Terracotta beads and pendants: 32, 35, 39, 40 and 45, Period IV; 33 and 44, Period V; 34, 36 and 42, Period III; 37 and 43, unstratified; 38 and 41, Period II (see pages 94 and 95)

2. Fragment of a bangle of glass, rectangular in section. From a mid-level of Period II. (HST 1-1459.)

3. Bangle of copper, rectangular in section. It has a rivet on one end and holes and was thus meant to be used on wrists of various sizes. The outside is decorated with herring-bone design. From an early level of Period III. (HST 1-179.)

4. Fragment of a copper bangle, rectangular in section. From an early level of Period III. (HST 1-758.)

5. Fragmentary bangle of copper, rectangular in section. From an early level of Period III. (HST 1-465.)

6. Fragment of an unevenly fashioned terracotta bangle, circular in section. From an early level of Period IV. (HST 1-103.)

7. Fragment of a terracotta bangle, rectangular in section. Unstratified. (HST 1-213.)

8. Fragment of a bangle of white glass, rectangular in section. The outer edge is decorated with light-brown bands on yellow background. From a late level of Period V. (HST 1-106.)

9. Fragment of a bangle of yellow glass, rectangular in section. From a late level of Period V. (HST 1-321.)

10. Fragmentary bangle of shell, rectangular in section. From a mid-level of Period V. (HST1-229.)

11. Fragment of a bangle of blue glass, circular in section, with grooved spirals round the circumference. From a late level of Period V. (HST 1-128.)

12. Fragmentary bangle of marble, rectangular in section. Unstratified. (HST 1-37.)

13. Fragmentary bangle of ivory, rectangular in section. From an early level of Period V. (HST 1-69.)

14. Fragment of an irregularly-shaped bangle of translucent glass, triangular in section. From a mid-level of Period V. (HST 1-57.)

15. Fragmentary bone bangle, rectangular in section. From a late level of Period V. (HST 1-256.)

16. Fragmentary bracelet of agate, double-convex in section. From a mid-level of Period V. (HST 1-457.)

17. Fragment of a bangle of translucent glass with light-brown outer edge, triangular in section. Unstratified. (HST 1-106.)

18. Fragment of a bangle of multi-coloured glass, oval in section, with studs placed round the outer edge. From an early level of Period V. (HST 1-376.)

19. Fragment of a bangle of black glass, rectangular in section. From a late level of Period V. (HST 1-100.)

20. Fragment of a bangle of multi-coloured glass, double-convex in section, with yellow studs round the light-brown outer edge. From a late level of Period V. (HST 1-263.)

21. Fragment of a bangle of stratified glass having green slip on blue, oblong in section, with yellow studs around the outer edge. From a late level of Period V. (HST 1-467.)

22. Fragment of a bangle of green glass, double-convex in section, with two rows of tiny studs round the outer edge. From a late level of Period V. (HST 1-233.)

(vi) *Rings*

Besides bangles, there were a few finger-rings recovered from the various levels. The following is the list of illustrated examples:—

Pl. LIV A

1. Fragment of a chalcedony ring, triangular in section, having a flat head. From a late level of Period III. (HST 1-586.)

2. Horn ring, double-convex in section, having a flat head. From a late level of Period III. (HST 1-1260.)

3. Small copper ring, rectangular in section. From an early level of Period III. (HST 1-1237.)
4. Copper ring, rectangular in section. From an early level of Period IV. (HST 1-542.)
5. Copper ring, triangular in section, having a flat head which may have been used as owner's stamp, the seal-mark being a conch. From a mid-level of Period IV. (HST 1-989.)
6. Copper ring, circular in section. From a mid-level of Period IV. (HST 1-1144.)
7. Small gold ring of a child, rectangular in section. From an early level of Period IV. (HST 1-1158.)
8. Copper ring, circular in section. From an early level of Period V. (HST 1-118.)

(vii) *Beads*[1]

The excavation yielded two hundred and eleven beads including one pendant, of which terracotta alone accounts for one hundred and sixteen. Of the remaining ninety-five, twelve are of copper, one each of gold and ivory and three of bone, while the material for the rest comprises carnelian, agate, chalcedony, onyx, crystalline quartz, amethyst, green jasper, faïence and glass.

Of the seventeen carnelian beads, two are etched (fig. 29, 21 and 23; pl. LV, 21 and 23) and belong to the late levels of Period V. The commoner shape,[2] however, is the spherical one and occurs in all the Periods excepting Period I. Other shapes represented in the material are: short bicone triangular faceted from Period II, long convex pentagonal from Period III (fig. 29, 29 and 11; pl. LV, 29 and 11) and long convex circular and short truncated bicone diamond from Period IV (fig. 29, 24; pl. LV, 24).

Agate is represented by seventeen beads, of which two, long convex circular, are etched (fig. 29, 22; pl. LV, 22) and come from Periods III and IV respectively. The common shape is the barrel or cylinder circular occurring in all the Periods excepting Period I. The long barrel circular ones are beautifully banded and belong to Period II (fig. 29, 25 and 26; pl. LV, 25 and 26). An individualistic type is the toggle from Period III (not illustrated).

Crystalline quartz is the material for another seventeen beads including one pendant. Of these, one, unbored, is translucent (fig. 29, 19; pl. LV, 19), while another one has a yellowish tinge (fig. 29, 18; pl. LV, 18). Out of the remaining fourteen, eleven were recovered in a hoard from a mid-level of Period III and save for the two faceted ones are all long convex circular. Other forms represented in the material are: pyramid-shaped pendant from Period IV and long barrel lenticular from Periods III and IV. It is noteworthy that beads of this material have not been found in Periods I and II.

The two beads of chalcedony were recovered from Period IV and are both spherical. Green jasper was represented by two beads, both faceted and recovered from Periods IV and V (fig. 29, 15 and 17; pl. LV, 15 and 17). Faïence beads again were only two, both, standard diamond faceted square, from Period IV. Onyx, amethyst and ivory are represented by one bead each (fig. 29, 12 and 28; pl. LV, 12 and 28). Of the three bone beads, one is standard barrel gadrooned from Period II, (fig. 29, 31; pl. LV, 31) and the other two, from Period III, are spherical (fig. 29, 2; pl. LV, 2).

Glass, which comes next in order of frequency, accounts for eighteen beads, of which ten are fragmentary. The colour ranges from black to deep blue and green. They also include four opaque beads, of which the spherical ones are etched (fig. 29, 4; pl. LV, 4). Glass beads are found in all the Periods excepting Period I and are distributed as follows:

[1] The sections on beads and metal objects have been contributed by Shri B. K. Thapar.
[2] The method of classification of shapes adopted here is that of H. C. Beck, 'Classification and nomenclature of beads and pendants', *Archaeologia*, LXXVII (1928), pp. 1 ff.

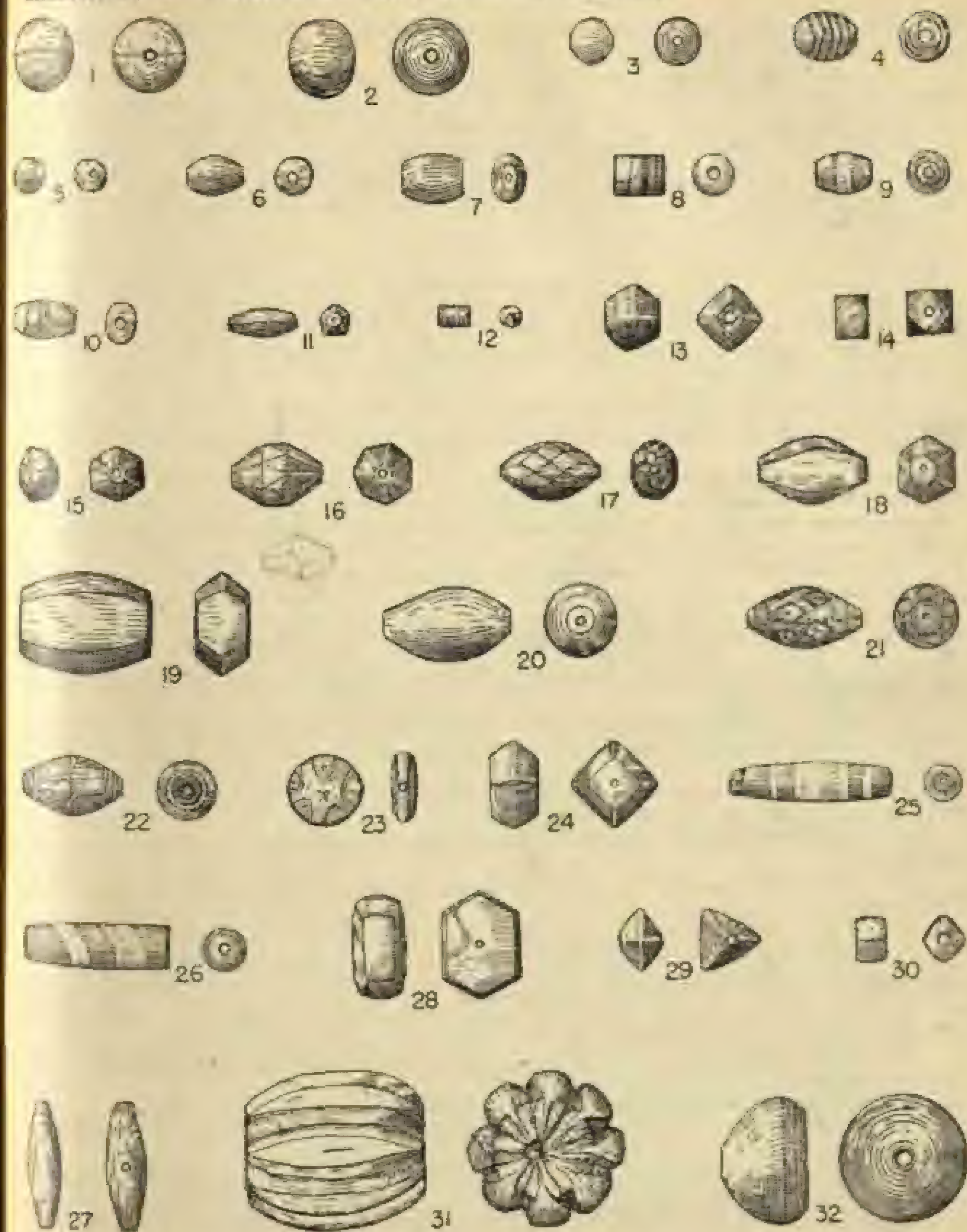


FIG. 29. *Beads.* $\frac{1}{1}$

Period II, 1; Period III, 10; Period IV, 3; and Period V, 4. The other shapes met with are long or short cylinder circular.

The twelve copper beads are distributed as follows: Period II, 2; Period III, 9; and Period IV, 1. The shapes met with are short or long barrel, square, spherical or diamond (fig. 29, 30; pl. LV, 30). Most of these are very fragile and fragmentary.

As already stated, terracotta is the material for the largest number (one hundred and sixteen) of beads. The commonest shape is the pear-shaped one, which occurs in fair abundance in all the Periods excepting Period I (fig. 29, 32; pl. LVI, 32).

The following beads are illustrated:—

Fig. 29; pls. LV and LVI

1. Carnelian: spherical. From an early level of Period IV. (HST 2-76.)
2. Bone: spheroid. From a mid-level of Period II. (HST 1-522.)
3. Glass, black opaque: spherical. From a mid-level of Period III. (HST 1-1048.)
4. Glass, black opaque, etched: ellipsoidal circular. From a mid-level of Period III. (HST 1-617.)
5. Vitreous material: standard ellipsoidal ill-shaped spheroid. From an unstratified [illegible] (HST 1-73.)
6. Carnelian: long convex circular. From an unstratified deposit. (HST 1-1275.)
7. Crystal, transparent: long barrel oval. From a late level of Period III. (HST 1-543.)
8. Agate, banded: long cylinder circular. From an early level of Period III. (HST 1-1241.)
9. Agate, banded: long barrel circular. From a late level of Period II. (HST 2-92.)
10. Agate, banded: long barrel elliptical. From an early level of Period V. (HST 1-612.)
11. Carnelian: long convex pentagonal. From an early level of Period III. (HST 1-1365.)
12. Onyx: long cylinder circular. From a mid-level of Period III. (HST 1-643.)
13. Glass, deep blue: standard truncated bicone diamond. From a mid-level of Period III. (HST 1-875.)
14. Faience: standard diamond-faceted square. From an unstratified deposit belonging to Period III. (HST 1-1058.)
15. Jasper: standard faceted hexagonal. From an early level of Period IV. (HST 1-1011.)
16. Crystal, transparent: long bicone cylinder septagonal. From a mid-level of Period III. (HST 2-31.)
17. Jasper: long convex diamond-faceted elliptical. From a late level of Period IV. (HST 2-74).
18. Crystal, light yellow: long convex hexagonal. From a late level of Period III. (HST 1-419.)
19. Crystal, translucent: long barrel hexagonal. From the earliest level of Period III. (HST 1-1479.)
20. Crystal, transparent: long convex circular. From a mid-level of Period III. (HST 2-31.)
21. Carnelian, etched: long convex circular. From the latest level of Period V. (HST 1-402.)
22. Agate, etched: long convex circular. From a late level of Period III. (HST 1-1067.)
23. Carnelian, etched: standard circular tabular. From a late level of Period V. (HST 2-36.)
24. Carnelian: short truncated bicone diamond. From a late level of Period IV. (HST 1-450.)
25. Agate, banded: long barrel circular. From a mid-level of Period II. (HST 2-106.)
26. Agate, banded: long barrel circular. From a pit belonging to the latest level of Period II. (HST 1-1271.)
27. Red jasper: toggle-shaped. From a mid-level of Period II. (HST 2-110.)
28. Amethyst: short truncated convex hexagonal. From a mid-level of Period III. (HST 1-445.)
29. Carnelian: short bicone triangular faceted. From a mid-level of Period II. (HST 1-1213.)
30. Copper: short cylinder diamond. From the earliest level of Period III. (HST 1-1257.)
31. Bone: standard barrel gadrooned. From a late level of Period II. (HST 1-559.)

32. Terracotta: standard pear-shaped. From a late level of Period IV. (HST 2-30.)

33. Terracotta: standard truncated bicone circular. From a late level of Period V. (HST 1-545.)

34. Terracotta: short blunt-edged lenticular circular. From a late level of Period III. (HST 1-1310.)

35. Terracotta: short truncated pear-shaped. From a late level of Period IV. (HST 1-399.)

36. Terracotta: standard bicone circular. From a mid-level of Period III. (HST 1-1387.)

37. Terracotta: standard fluted. From an unstratified deposit. (HST 1-1028.)

38. Terracotta: short blunt-edged bicone circular. From a late level of Period II. (HST 1-882.)

39. Terracotta: standard spherical, incised with a melon-shaped pattern. From a late level of Period IV. (HST 1-655.)

40. Terracotta: standard spherical. From a mid-level of Period IV. (HST 1-407.)

41. Terracotta: standard vase-shaped circular. From a pit belonging to the latest level of Period II. (HST 1-1272.)

42. Terracotta: standard vase-shaped circular. From an early level of Period III. (HST 1-499.)

43. Terracotta: short vase-shaped circular. From an unstratified deposit. (HST 1-20.)

44. Terracotta: unbored long cylinder circular incised on either end with converging lines. From a late level of Period V. (HST 1-331.)

45. Terracotta: long ill-shaped barrel circular with an additional hole at one point of the profile. From an early level of Period IV. (HST 1-746.)

46. Terracotta: conical pendant with a hole for suspension. From an unstratified deposit. (HST 1-778.)

(viii) *Metal objects*

1. Copper and bronze.—The excavation yielded one hundred and eightytwo copper objects, of which nearly eightyfive are either shapeless or indeterminate. They also include four bangle pieces and twelve beads which have been described elsewhere (above, pp. 90-94). It is noteworthy that copper was found in all the Periods excepting Period I, wherein its absence may perhaps be partly due to the fact that not much of the area belonging to this Period was excavated. Of singular interest is an arrow-head (fig. 30, 22) found in association with the Painted Grey Ware. Equally interesting are: (1) a borer from Period II (fig. 30, 7); (2) a reel or spool from an unstratified deposit of Period III (fig. 30, 20); (3) a nail-parer from the accumulation following the erosion (fig. 30, 5); and (4) a bell from Period IV (fig. 30, 11). The commonest object, however, is the antimony rod.

The selected specimens are listed below:—

Fig. 30

1. Antimony rod of round section thickened at the ends. From a mid-level of Period IV. (HST 1-489.)

2. Antimony rod of round section thickened at the ends and longer than no. 1. From an early level of Period IV. (HST 1-877.)

3. Antimony rod of round section. From a mid-level of Period III. (HST 1-848.)

4. Variant of the above. From the accumulation following the erosion. (HST 1-1234.)

5. Nail-parer of round section flattened at the working end. From the accumulation following the erosion. (HST 1-1335.)

6. Nail-parer of round section, the lower half decorated with grooves and thereafter flattened for the working end. From a mid-level of Period III. (HST 1-1182.)

7. Borer of round section; the top square part is decorated with incised lines forming diamond-pattern. From a late level of Period II. (HST 1-1288.)

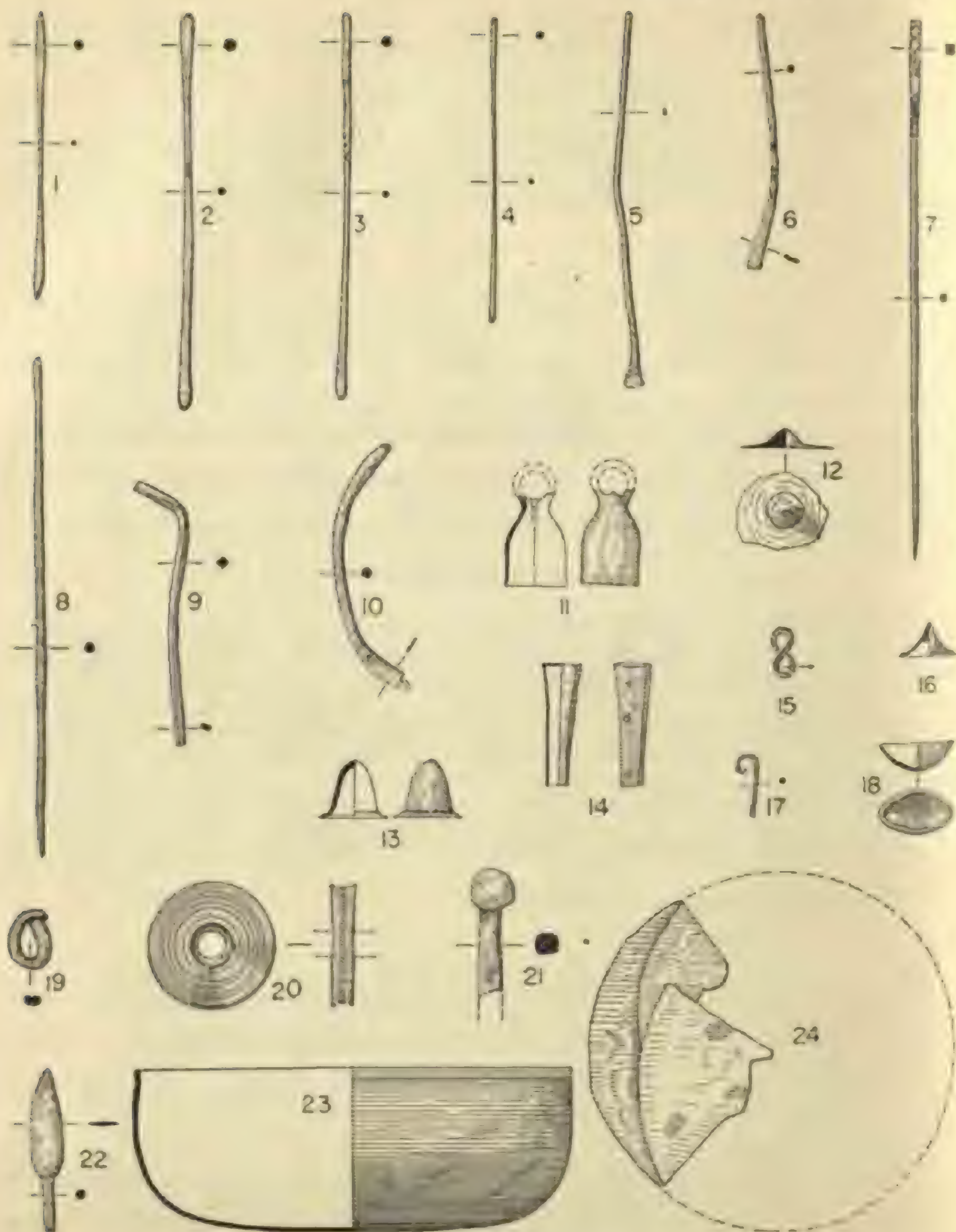


Fig. 30. *Copper objects.* ½

8. Borer(?) of round section. From a late level of Period V. (HST 2-38.)

9. Spike(?) of square section. From an early level of Period III. (HST 1-119.)

10. Object of indeterminable use (probably a latch) of round section flattened at one end. From the earliest level of Period III. (HST 1-1273.)

11. Miniature bell. From a mid-level of Period IV. (HST 1-815.)

12. Stopper(?). From a mid-level of Period IV. (HST 1-1156.)

13. Stopper. From the same deposit as above. (HST 1-1066.)

14. Cap for a stick-handle or a ferrule with provision for nails. From a late level of Period III. (HST 1-618.)

15. Brooch or piece of a chain of a thin oblong section. From a late level of Period III. (HST 1-532.)

16. Object of indeterminate use. From a late level of Period III. (HST 1-1586.)

17. Hooked pin of round section. From an early level of Period IV. (HST 1-1217.)

18. Object of indeterminate use. From an early level of Period III. (HST 1-1270.)

19. Object of indeterminate use. From an unstratified deposit. (HST 1-844.)

20. Reel or spool. From an unstratified deposit of Period III. (HST 1-1163.)

21. Nail of squarish section with a knob-head. From a mid-level of Period V. (HST 1-699.)

22. Arrow-head. From a late level of Period II. (HST 1-1332.)

23. Bowl. From a mid-level of Period V. Associated with it was a coin of Balban. Also pl. LIV B. (HST 1-238.)

24. Circular disc of thin section, folded. From the accumulation following the erosion. (HST 1-973.)

II. Iron.—Iron objects from the excavation number one hundred and twentysix, besides ninety shapeless bits and slag pieces. They include nails, borers, staples, door-rings, spear- and arrow-heads and chisels.

It is noteworthy that iron is conspicuous by its absence in Periods I and II, barring a couple of slag lumps found in the top layers of the latter Period (see above, p. 13). Of special interest in each Period of their occurrence are: (1) a barbed and socketed arrow-head from the earliest level of Period III (fig. 31, 19); (2) a chisel from a late level of Period III (fig. 31, 12); (3) an adze from an unstratified deposit of Period IV (fig. 32, 26); and (4) a spear-head from an early level of Period V (fig. 32, 21).

Selected specimens are listed below:—

Figs. 31 and 32

1. Nail of round section with a flat circular head. From a late level of Period V. (HST 1-195.)

2. Nail of round section with a knob-head. From an early level of Period IV. (HST 1-868.)

3. Nail of square section with a flat hook-head. From a late level of Period V. (HST 1-252.)

4. Nail of square section with a folded head. From a late level of Period V. (HST 1-315.)

5. Nail of roundish section with a folded head. From a late level of Period IV. (HST 1-629.)

6. Nail of square section with an expanded folded head, also showing a hole therein. From a late level of Period IV. (HST 2-10.)

7. Bar of square section (possibly a long chisel) with a flattened lower end. From an unstratified deposit of Period IV. (HST 1-384.)

8. Borer of round section. From a mid-level of Period V. (HST 1-585.)

9. Borer of round section. From a late level of Period V. (HST 1-275.)

10. Borer of squarish section. From a late level of Period V. (HST 1-83.)

11. Awl of round section. From a late level of Period V. (HST 1-354.)

12. Chisel. From the latest level of Period III. (HST 1-662.)

13. Staple. From a late level of Period V. (HST 1-293.)

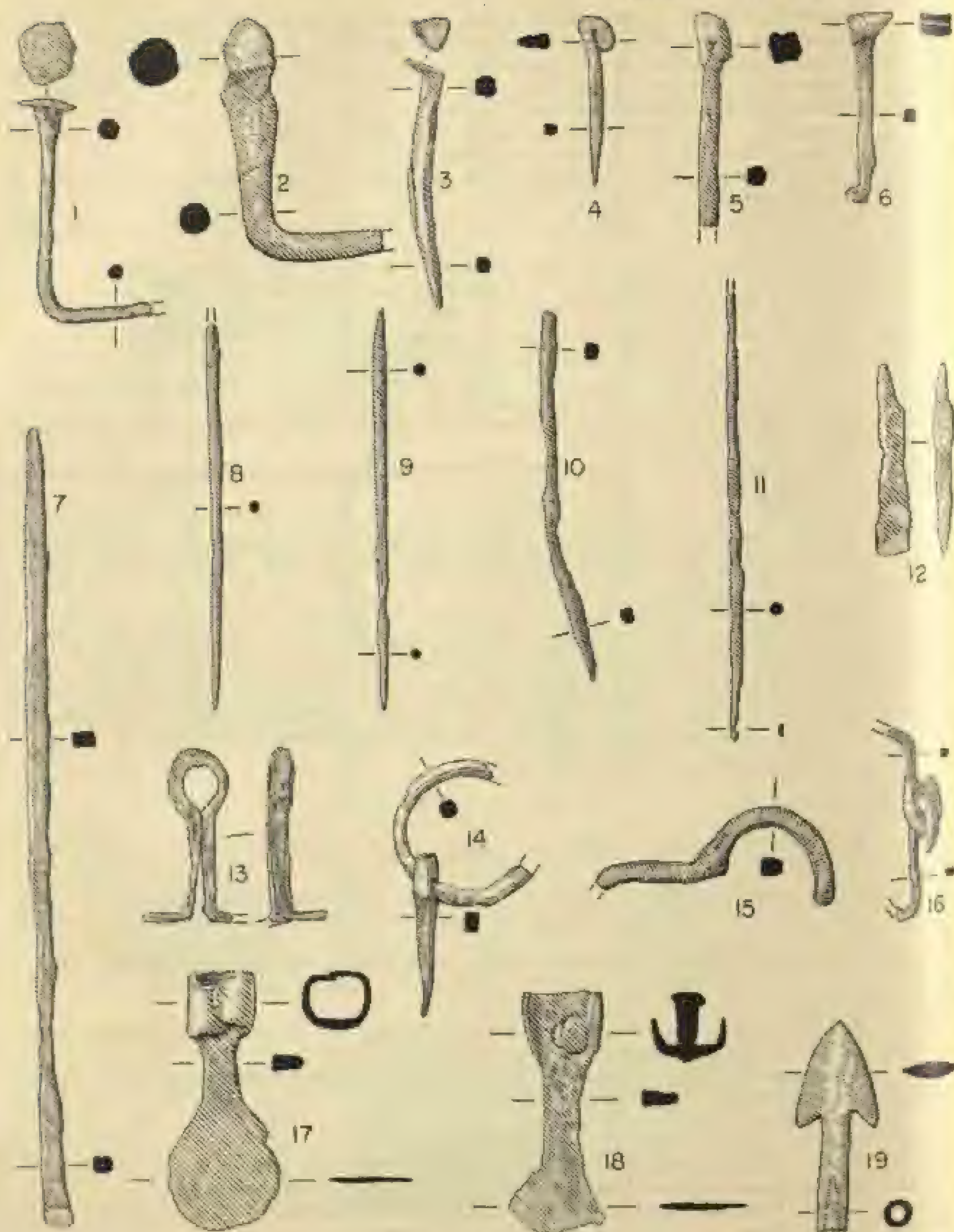


FIG. 31. *Iron objects.* ½

14. Door-ring. From a mid-level of Period V. (HST 1-299.)

15. Hook, probably a latch. From a late level of Period V. (HST 1-540.)

16. Fragment of a chain. From a late level of Period V. (HST 1-201.)

17. Hoe-shaped object, socketed at the top by folded ends to provide for the handle. From the latest level of Period V. (HST 2-67.)

18. Hoe-shaped object with a provision for rivetting the handle. From a mid-level of Period V. (HST 1-544.)

19. Arrow-head, barbed and socketed. From the earliest level of Period III. (HST 1-1409.)

20. Arrow-head, tanged, with a flattened section. From the latest level of Period V. (HST 1-267.)

21. Spear-head, tanged, with a flattened section. From an early level of Period V. (HST 1-175.)

22. Fragmentary knife-blade. From an early level of Period V. (HST 1-285.)

23. Miniature bell. From a mid-level of Period IV. (HST 1-715.)

24. Object shaped like a snake-hood. From a mid-level of Period V. (HST 1-312.)

25. Object of indeterminate use (probably a sickle-blade). From a late level of Period III. (HST 2-73.)

26. Adze. From an unstratified deposit belonging to Period IV. (HST 1-1036.)

27. Bracelet-shaped object of circular section with unconnected ends. From an unstratified deposit belonging to Period III. (HST 1-1027.)

28. Ring of circular section. From a mid-level of Period V. (HST 1-433.)

29. Ring with overlapping ends. From a late level of Period V. (HST 1-434.)

30. Base-fragment of a pan presumably with loop-handles on either end. From an early level of Period IV. (HST 1-43.)

31. Tube rivetted with a vertical bar of squarish section. From the latest level of Period IV. (HST 1-341.)

32. Object of indeterminate use and of rectangular section (probably a spike). From a mid-level of Period IV. (HST 1-802.)

33. Object of indeterminate use (probably a sickle-blade). From a late level of Period IV. (HST 1-455).

34. Bent bar of square section with one end flattened. From a mid-level of Period V. (HST 1-80.)

35. Object of thin flattened section with an expanded lower end. From a late level of Period IV. (HST 1-810.)

(ix) *Inscribed potsherds and a seal*

The excavation yielded two inscribed potsherds and a seal, all of which came from Period IV.

Pl. LVII A

1. Rim of a vase of red ware. The inscription on it reads *Sadhujātasa*, 'of Sadhujāta', in Brāhmī characters of about the Christian epoch. From a mid-level of Period IV. (HST 1-986A.)

Pl. LVII B

2. Neck-fragment of a vase of red ware. The three complete letters are *nikasa*, while there is an indication of other letters both before and after them. On palaeographic grounds the letters may be assigned to the second century A.D. From a late level of Period IV. (HST 1-820.)

Pl. LVIII A

3. Terracotta seal with a perforated knob. Through the hole was presumably tied a cord for suspension. The horizontal and vertical lines (shallower than the incised letters) shew that space for individual letters had been marked out before inscribing them. The seal reads as follows:



FIG. 32. *Iron objects.* $\frac{1}{3}$

Top. *Śaṅkha* symbol.

L. 1. The first letter is not clear but it is likely to have been *thi*. The next three letters are *kaputra*, while the last letter, though damaged, may be read as *sa*. Thus *thi*(?)*kaputrasa*.

L. 2. The first three letters are clearly *jayaśa*. The fourth letter may be read as *ma*(?), while the last letter is a clear *sa*. Thus *Jayaśama*(?)*sa*.

L. 3. The last letter is a clear *sa*, but the first two letters are comparatively obscure. The reading may be *roṭṭ*(*ḍḍ*)*isa*.[1]

The whole inscription thus works out to be *Thi*(?)*kaputrasa Jayaśamasa roḍḍ*(?)*isa*, meaning thereby '(the seal) of Jayaśama (Skt. Jayaśarman), son of *thi*(?)*ka*'. The meaning of the word *roḍḍi* is not clear.

The characters by themselves put the inscription in the late second or early third century A.D.

From a late level of Period IV. (HST 1-833).

(x) *Coins*

Eightyfive coins were obtained from the excavation, in addition to four picked up on the surface. Out of the total of eightynine, only thirtyfive were in a fair state of preservation permitting identification. The rest had either considerably disintegrated or, even if the metallic core was holding together, the symbols on them had been completely defaced.

Periods I and II did not yield any coin. From Period III were recovered two distinct varieties of coins, viz. punch-marked and uninscribed coins. The former were flat, rectangular pieces of either copper or silver and bore punched symbols including 'crescent-on-hill', 'sun' and the like. A majority of the latter was cast in a mould, the metal being invariably copper. The symbols thereon consisted of 'crescent-on-hill', 'tree-in-railing', circlets, etc.

The largest number of coins came from Period IV. They included two each of the uninscribed cast and punch-marked types, five of the rulers of Mathurā, six of the Yaudheya kings and ten imitating those of the Kushan king Vāsudeva.[2] The coins of the kings of Mathurā occurred in the lower levels of the Period. Struck on copper, they had the usual Lakshmī figure on the obverse. In the better-preserved examples the inscription could also be made out, partly or wholly. In two cases the name of the king Śeshadatta could be definitely read. According to Vincent A. Smith, these coins may be placed in the second century B.C.[3]

From the middle levels of the Period were obtained the Yaudheya coins. They bore on the obverse and reverse respectively the figure of a bull and an elephant. On the obverse, above the bull, was also the legend referring to the Yaudheyas. Smith considers this 'bull and elephant' type of coins as 'the earliest' amongst the Yaudheya series and puts them 'a little before or after the Christian era'.[4]

The imitation coins of Vāsudeva lay associated with the last but one structural Sub-period of Period IV. Made of copper, they were divisible into two sub-types. In one case the obverse and reverse had respectively 'the king at altar' and 'Śiva and bull', while, in the other, a 'throned goddess' replaced 'Śiva and bull' on the reverse. Since the Kushan chronology as a whole remains still unsettled, it is difficult to be positive about the date of Vāsudeva. According to Smith, who argues for a late date,

[1] Suggested by Dr. B. Ch. Chhabra.

[2] See above, p. 19, n.

[3] Vincent A. Smith, *Catalogue of the Coins in the Indian Museum, Calcutta* (Oxford, 1906), I, p. 192.

[4] *Ibid.*, p. 165.

the king may have reigned between A.D. 185 and 220,[1] and the imitation coins, therefore, should be dated to a period thereafter.

In Period V, only one coin was found. It lay in a layer between structural Sub-periods 2 and 3, the total number of Sub-periods being four. The coin referred to Sultān Ghiyāṣu'd Dīn Balban (A.D. 1266-87) of the Slave Dynasty, the metal used being billon.

The surface-finds included an uninscribed cast coin, a Kushan coin and one coin each of Qutbu'd Dīn Mubārak Shāh (A.D. 1316-1320) and Maḥmūd Shāh II (A.D. 1392-1412) respectively of Khaljī and Tughluq dynasties. Though picked up on the surface, the last-named coin might indicate the approximate period up to which the last occupation at Hastināpura continued.

Below are described the more legible of the coins:—

A. PUNCH-MARKED COINS

1. *Obv.* Sun, crescent-on-hill and tree.
Rev. Defaced.
Metal: silver; *size:* ·56" × ·55"; *weight:* 36·05 gr.; *shape:* irregular; *condition:* fair, with two holes. From an early level of Period III. (HST 1-460.) Pl. LVIII B, 8.

2. *Obv.* Sun and other indistinct symbols.
Rev. Caduceus and four conjoined circles.
Metal: silver; *size:* ·8" × ·55"; *weight:* 38·65 gr.; *shape:* rectangular; *condition:* fair. From the make-up of wall 88 of Period IV. (HST 1-1093.) Pl. LVIII B, 9.

3. *Obv.* Tree and crescent-on-hill.
Rev. Defaced.
Metal: copper; *size:* ·63" × ·5"; *weight:* 34·5 gr.; *shape:* irregular; *condition:* fair. From a mid-level of Period IV. (HST 1-446.) Pl. LVIII B, 10.

B. UNINSCRIBED COPPER COINS

1. *Obv.* Crescent-on-hill, consisting of three arches in two tiers. Pellets on left and in arches.
Rev. Tree with ovate lanceolate leaves.
Size: ·55" × ·53"; *weight:* 57·30 gr.; *shape:* square; *condition:* good. From a late level of Period III. (HST 1-1238.)[2] Pl. LVIII B, 1.

2. *Obv.* Defaced.
Rev. Tree within railing.
Size: ·66"; *weight:* 69·95 gr.; *shape:* round; *condition:* fair. From a late level of Period III. (HST 1-928.) Pl. LVIII B, 2.

3. *Obv.* Defaced.
Rev. Tree within railing, as on no. 2.
Size: ·6"; *weight:* 30·4 gr.; *shape:* round; *condition:* fair. From an early level of Period III. (HST 1-950.)

4. *Obv.* Square with diagonals.
Rev. Circle with four crescents around.
Size: ·45"; *weight:* 39·10 gr.; *shape:* round; *condition:* fair. From a late level of Period III. (HST 1-631.) Pl. LVIII B, 3.

5. *Obv.* Same as no. 4.
Rev. Same as no. 4.
Size: ·35"; *weight:* 32·65 gr.; *shape:* round; *condition:* fair. From an early level of Period III. (HST 1-1195.) Pl. LVIII B, 4.

[1] Smith, *op. cit.*, p. 84.
[2] Cf. J. Allan, *Catalogue of the Coins of Ancient India* (London, 1936), pl. XI, 19, 20 and 21.



A. *Inscribed pot, Period IV* (see page 99)

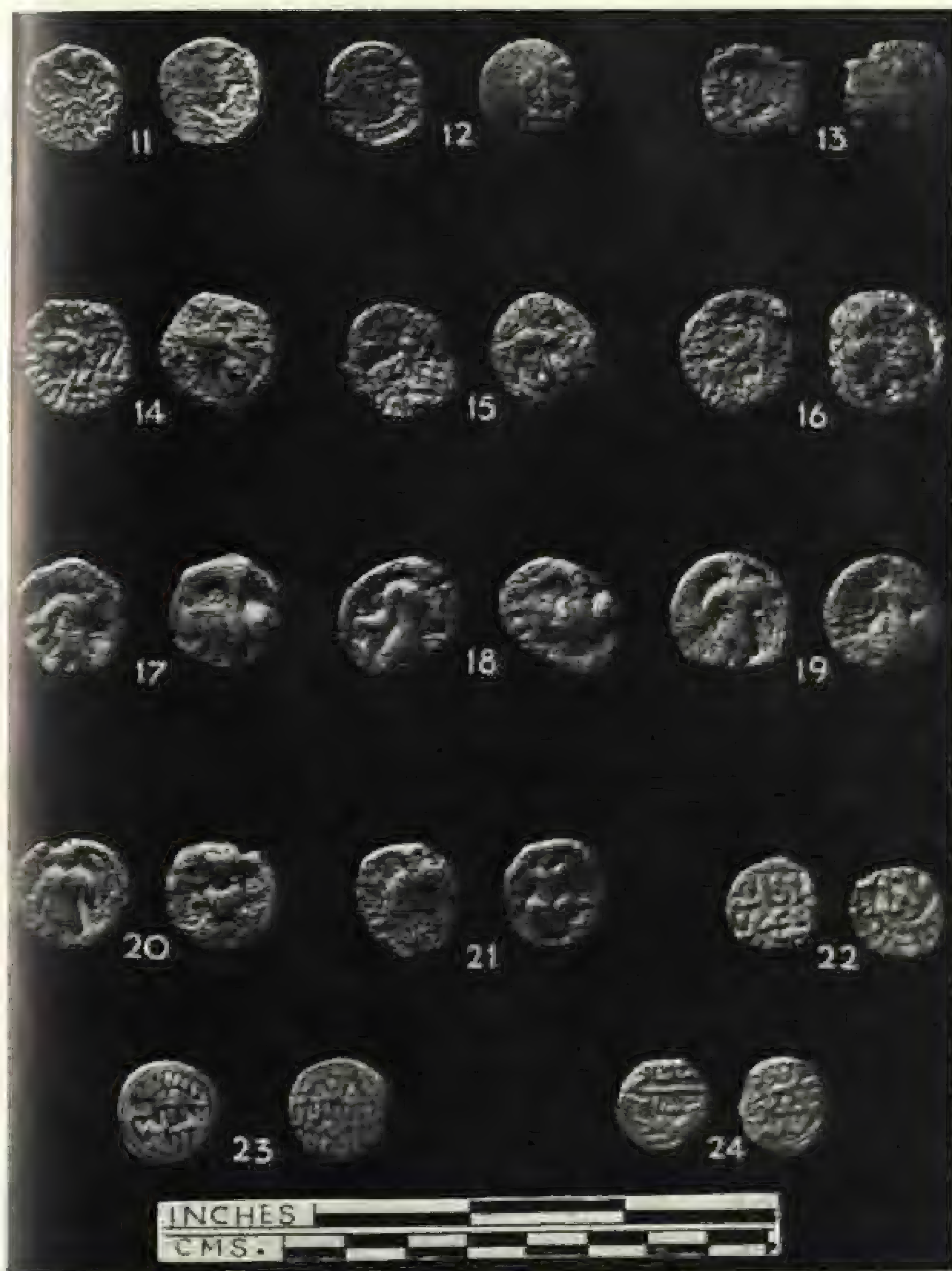


B. *Inscribed potsherd, Period IV* (see page 99)



A. *Inscribed terracotta seal (left) and its cast (right), Period IV* *(see page 99)*

B. *Coins: 1-4 and 8, Period III; 5, 7 and 9-10, Period IV; 6, surface* *(see pages 101 and 102)*



Coins: 11-21, Period IV; 22, Period V; 23 and 24, surface (see pages 103-05)

To face page 103

Miscellaneous [illegible] Period II; [illegible] and [illegible] Period II; [illegible] and [illegible], Period III; [illegible] Period V (see page 103)

6. *Obv.* Elephant to right.

Rev. Crescent-on-hill, the tiers of the latter being not very clear.

Size: ·6" × ·5"; *weight:* 87·9 gr.; *shape:* rectangular; *condition:* good. From an early level of Period IV. (HST 1-634.) Pl. LVIII B, 5.

7. *Obv.* Elephant to right.

Rev. Tree within railing with birds on branches.

Size: ·6" × ·45"; *weight:* 48·3 gr.; *shape:* rectangular; *condition:* good. From surface near site HST 3. (HST 3-1.)[1] Pl. LVIII B, 6.

8. *Obv.* Parallel oblique lines.

Rev. Parallel vertical lines.

Size: (?) ·5"; *weight:* 20·7 gr.; *shape:* irregular; *condition:* fair. From a late level of Period IV. (HST 1-416.) Pl. LVIII B, 7.

C. Mathura copper coins

1. *Obv.* Standing figure of Lakshmī facing; symbols on right and left; legend, *rajño Śeshadatasa.*

Rev. Defaced.

Size: ·73"; *weight:* 89·55 gr.; *shape:* round; *condition:* fair. From an early level of Period IV. (HST 1-682.)[2] Pl. LIX, 11.

2. *Obv.* Standing figure of Lakshmī facing; row of dots beneath; symbols on right and left; legend mainly off the flan.

Rev. Indistinct.

Size: ·67"; *weight:* 114·55 gr.; *shape:* round; *condition:* fair. From an early level of Period IV, associated with flooring 2. (HST 1-181.) Pl. LIX, 12.

3. *Obv.* Standing figure of Lakshmī facing; row of dots underneath; symbol on right; legend, *Śeshadatasa.*

Rev. Defaced.

Size: ·66"; *weight:* 90·35 gr.; *shape:* round; *condition:* worn out. From an early level of Period IV. (HST 1-716.)

4. *Obv.* Standing figure of Lakshmī, facing; symbol on right; legend indistinct.

Rev. Defaced.

Size: ·7"; *weight:* 47·1 gr.; *shape:* round; *condition:* worn out. From an early level of Period IV. (HST 1-752.)

5. *Obv.* Three dots at bottom left; legend indistinct, only traces of *ta.*

Rev. Defaced.

Size: fragmentary; *condition:* worn out. From an early level of Period IV. (HST 1-461.) Pl. LIX, 13.

D. Yaudheya copper coins

1. *Obv.* Bull to r. before a railing with a curved object shooting from it; legend, *y(o)dh(e)... bahudhañake.*

Rev. Defaced.

Size: ·8"; *weight:* 58·4 gr.; *shape:* round; *condition:* fair. From a late layer of Period IV. (HST 1-397.)[3] Pl. LIX, 14.

2. *Obv.* Bull (hind part damaged) to r. before the symbol as on no. 1; legend obliterated except for the letter *ya.*

Rev. Elephant to r.

Size: ·8"; *weight:* 50·05 gr.; *shape:* round; *condition:* fair. From a mid-level of Period IV. (HST 1-707.) Pl. LIX, 15.

---

[1] Cf. Allan, *op. cit.*, pl. XI, 22.

[2] *Ibid.*, pp. cx-cxi.

[3] Allan, *op. cit.*, pl. XXXIX, 14.

3. *Obv.* Bull to r. before the symbol as on no. 1; legend, *y(o)dheya ba.*
Rev. Defaced.
Size: ·8"; *weight:* 58·4 gr.; *shape:* round; *condition:* worn out. From a mid-level of Period IV. (HST 1-858.) Pl. LIX, 16.

4. *Obv.* Bull to r. before the symbol as on no. 1; legend obliterated.
Rev. *Nandipada* above elephant(?).
Size: ·83"; *weight:* 53·45 gr.; *shape:* round; *condition:* fair. From a mid-level of Period IV. (HST 1-861.)

5. *Obv.* As on no. 4, legend obliterated except for the letter *dha.*
Rev. Defaced.
Size: ·8"; *weight:* 36·1 gr.; *shape:* round; *condition:* highly corroded. From a mid-level of Period IV. (HST 1-1145.)

6. *Obv.* Hind part of bull; legend, *bah[u]dha[ña].*
Rev. Defaced.
Size: fragmentary; *weight:* 14·9 gr.; *shape:* round; *condition:* fragmentary. From an unstratified deposit of Period IV. (HST 1-739.)

E. Imitation copper coins of Vāsudeva[1]

1. *Obv.* King standing; right hand on altar.
Rev. Standing Śiva with bull behind.
Size: ·75"; *weight:* 92·45 gr.; *shape:* round; *condition:* fair. From a late level of Period IV. (HST 1-327C.) Pl. LIX, 17.

2. *Obv.* Same as no. 1.
Rev. Same as no. 1.
Size: ·81"; *weight:* 90·9 gr.; *shape:* round; *condition:* fair. Found along with no. 1. (HST 1-327F.) Pl. LIX, 18.

3. *Obv.* King standing; the upraised left hand holds a trident.
Rev. Śiva and bull.
Size: ·78"; *weight:* 86·85 gr.; *shape:* round; *condition:* fair. Found along with no. 1. (HST 1-327J.) Pl. LIX, 19.

4-6. Of the same type as no. 1 and also found along with it. (HST 1-327 E, H and I.)

7. *Obv.* King standing, left hand upraised.
Rev. Goddess seated on throne.
Size: ·75"; *weight:* 106·5 gr.; *shape:* round; *condition:* fair. Found along with no. 1. (HST 1-327A.)[2] Pl. LIX, 20.

8. *Obv.* Same as no 7.
Rev. Same as no. 7.
Size: ·75"; *weight:* 64·55 gr.; *shape:* round; *condition:* fair. Found along with no. 1. (HST 1-327D.) Pl. LIX, 21.

9-10. Of the same type as nos. 7 and 8, and found along with them. (HST 1-327B and G.)

F. Muslim coins

(i) *Coin of Ghiyāṣu'd Dīn Balban* (A.D. 1266-87)

Obv. *As Sulṭān-al-A'ẓam Ghiyāṣu'd-Dunyā wad-Dīn.*
Rev. Within circle *Balban*, around *Śrī Sultān Gayāsudīn* (in Nāgarī script).

[1] See above, p. 19, n.
[2] Cf. R. B. Whitehead, *Catalogue of the Coins in the Punjab Museum, Lahore* (Oxford, 1914), I, pl. XIX, 228.

Metal: billon; *size:* ·61"; *weight:* 49·35 gr.; *shape:* round; *condition:* good. From a mid-level of Period V. (HST 1-239.)[1] Pl. LIX, 22.

(ii) *Coin of Quṭbu'd Dīn Mubārak Shāh of Khaljī dynasty.* (A.D. 1316-1320)

Obv. *Khalīfa-i- Rabbu'l 'Ālamīn Quṭbu'd Dunyā wad-Dīn.*
Rev. *Abu'l Muẓaffar Mubārak Shāh as-Sulṭān ibn-as-Sulṭān Alwāthiq Billāh.*
Metal: base silver; *size:* ·67"; *weight:* 46·35 gr.; *shape:* round; *condition:* good. From a surface-deposit. (HST 2-33.)[2] Pl. LIX, 23.

(iii) *Coin of Maḥmūd Shāh II of Tughluq dynasty* (A.D. 1392-1412)

Obv. *Sulṭān Maḥmūd Shāh.*
Rev. *Dāru'l-mulk-i-Dihlī.* 81(5) A.H.
Metal: copper; *size:* ·63"; *weight:* 69 gr.; *shape:* round; *condition:* good. From surface. (HST 1-1072.)[3] Pl. LIX, 24.

(xi) *Miscellaneous objects of bone, ivory, etc.*[4]

The excavation yielded quite a large number of bone styli, awls and knitting needles; except six examples belonging to Period IV, all of these were recovered from Periods II and III with the majority in the former. Such knitting needles have also been recovered from Nāsik,[5] where they occur in very large numbers. Another noteworthy find is the occurrence of horns especially of the antelope and deer. But for the two stray examples in Period IV, these, too, were confined to Periods II and III.

The following are selected for illustration:—

Pl. LX

1. Bone: stylus (?). From a late level of Period II. (HST 2-65.)
2. Bone: awl. From an early level of Period IV. (HST 1-1151.)
3. Bone: knitting needle. From an early level of Period II. (HST 2-113.)
4. Bone: knitting needle. From an early level of Period II. (HST 2-112.)
5. Ivory: part of a mirror-handle. From an early level of Period IV. (HST 1-314.)
6. Bone: gamesman or weight. From the latest level of Period II. (HST 1-1464.)
7. Bone: stopper. From an early level of Period III. (HST 1-588.)
8. Horn: tooth-pick. From a late level of Period III. (HST 1-620.)
9. Ivory: perforated cylindrical object of indeterminate use, decorated with a panel of punched circles between marginal grooves on either side. From a mid-level of Period V. (HST 1-290.)
10. Ivory: part of a circular disc. From the accumulation following the erosion. (HST 1-571.)
11. Bone: socket (probably a cap to secure the working point of the stylus). From a late level of Period II. (HST 2-62.)
12. Horn: object of indeterminate use decorated with bold ribs. From an early level of Period II. (HST 1-825.)

[1] Cf. H. N. Wright, *Catalogue of the Coins in the Indian Museum, Calcutta* (Oxford, 1907), II, pl. III, 156.

[2] The author is grateful to Shri Yusuf Kamal Bukhari for identifying this coin. See Wright, *op. cit.*, pl. IV, 262.

[3] Cf. Wright, *op. cit.*, pl. VII, 518.

[4] Contributed by Shri B. K. Thapar.

[5] From a comparative study of the material lying in the Deccan College and Post-Graduate Research Institute, Poona; by courtesy of Professor H. D. Sankalia who carried out the excavations.

13. Horn: fragment of a bracelet decorated with rope-design. From the accumulation following the erosion. (HST 1-1402.)

14. Ivory: perforated pear-shaped object decorated with grooves. From an unstratified deposit of Period II. (HST 1-511.)

H. Brick-measurements[1]

In the accompanying chart are shown dimensions in inches of bricks used at Hastināpura in various Periods. As already stated (above, p. 10), the excavation revealed five Periods of occupations. Of these, the earliest, viz. Period I, was completely devoid of any structural remain. In Period II, although no regular house-plans, excepting a few mud or mud-brick walls, were met with, there is some evidence in the shape of brick-bats to show the use of kiln-burnt bricks. Unfortunately, from the brick-bats recovered it has not been possible to reconstruct all the three dimensions. The thickness which alone is available is 2·2 in.

Of Period III, only six structures were exposed, two of which were drains and one barn(?). The brick-sizes in this Period fall into three batches: the use of trapezoidal bricks of the dimensions of 12 × 9·5 and 6 × 2·75 in. is a new feature of the Period and although used for house-walls as well (above, p. 15), they seem to be best suited for circular structures like the barn or the top floor round the rim of ring-wells wherein their size becomes shorter, 8·5 to 9 × 7 to 8·5 and 5·2 × 2 in. Characteristic of the Period, however, is the size 17 × 9 × 2·7 in. Bricks of this size were used in both the drains of this Period (pl. XXIV). It is interesting to note that mud-bricks of this Period also follow the same size. The third batch, with the size 14·7 × 9 × 2·7 in., is used for the 'stepped wall' belonging to the last phase of the Period. It is this size which with a little modification is later on adopted in Period IV.

A majority of the structures laid bare belongs to Period IV, which, in the main, shows three groups of sizes in bricks. The normal size, typical of this Period, is 14·4 × 8·75 × 2·5 in. Bricks of this size are used mostly for house-walls. A noteworthy feature of these bricks is that they bear on their top a design executed before firing by moving four fingers in a roughly circular fashion. For floorings and platforms slightly larger bricks are used.

Period III

	Group A			Group B			Group C		
	Max.	*Min.*	*Normal*	*Max.*	*Min.*	*Normal*	*Max.*	*Min.*	*Normal*
Length ...	17·75	17	17·5	12·25	9	12	14·7	14·3	14·5
Breadth ...	10	9·7	9·75	9·5 and 6	7 and 5	9 and 5·5	9	9	9
Thickness ...	2·75	2·55	2·75	3	2	2·5	2·7	2·5	2·[illegible]

[1] Contributed by Shri B. K. Thapar.

A batch peculiar to Period IV and exclusively meant for floorings has the dimension 11·25 × 11 × 4 in. In addition, re-used bricks of the earlier period of the size of 16·75 × 9 × 2·7 in. were also used for some floorings (pl. XXIV).

Structures of Period V are all built of brick-bats and re-used bricks of earlier periods. No measurement is, therefore, of any use in this case. Nor were structures of *lakhori* bricks met with.

Period IV

	Group A			Group B		
	Max.	*Min.*	*Normal*	*Max.*	*Min.*	*Normal*
Length ...	15·5	13	14·5	11·5	10	11·25
Breadth ...	9	8·5	8·75	11·25	9·5	11
Thickness ...	2·75	2	2·5	4·5	4	4

Measurement in inches.

I. Animal-remains[1]

The animal-remains from Hastināpura are mainly from two cuttings, viz. HST 1 and HST 2. HST 1 yielded a larger collection than HST 2. Fortunately the stratigraphy and the periods of the sites mentioned above have been determined and so it has become possible to know the fauna which lived in different periods.

The following species are represented in Period II: *Equus caballus* (from a late level); *Bos* (*Bubalus*) *bubalis*; *Bos indicus*; *Ovis vignei*; and *Sus cristatus*.

The following species are represented in Period III: *Lissemys punctata*, forma *typica*; *Chitra indica*; *Trionyx gangeticus*; *Elephas maximus*; *Bos* (*Bubalus*) *bubalis*; *Bos indicus*; *Ovis vignei*; *Capra hircus aegagrus*; and *Sus cristatus*.

The following species are represented in Period IV: *Bos* (*Bubalus*) *bubalis*; *Bos indicus*; *Ovis vignei*; and *Elephas maximus*.

Only *Bos indicus* and *Capra hircus aegagrus* appear in Period V.

These animal-remains in general resemble in their species those of Harappā[2] and Mohenjo-daro[3] as well as those of Anau (cultures I and II).[4]

In most cases the animal-remains from Hastināpura are very fragile and fragmentary in nature. The organic material of the bones has disappeared to a certain extent and they are impregnated with inorganic material. Even the long bones, such as humerus, radius, femur, tibia and cannon bones are either broken or fragmentary in nature. Most of the bones consist of fragments only and are hence unsuitable for measurements, etc. In many cases charred bones have been found, as at Harappā and Mohenjo-daro.

[1] Contributed by Shri Bhola Nath, Vertebrate Zoologist, Department of Anthropology, Government of India, Calcutta.

[2] B. Prasad, *Animal Remains from Harappa*, Mem. Arch. Surv. Ind., no. 51 (Delhi, 1936).

[3] R. B. S. Sewell and B. S. Guha in *Mohenjo-daro and the Indus Civilization*, II (London, 1931).

[4] J. U. Duerst, 'Animal remains from the excavations at Anau', *Explorations in Turkestan, Prehistoric Civilization of Anau*, II (Washington, 1908).

As in the case of Anau, Mohenjo-daro and Harappā collections, there is a large number of bones which belong to young animals. A number of bones, particularly of *Bos indicus*, *Bos* (*Bubalus*) *bubalis*, *Ovis vignei*, and *Sus cristatus*, have definite marks of cuts by sharp instruments, which indicate that the inhabitants probably used these animals for food.

Only thirteen species are so far represented in the Hastināpura collection. As compared with Harappā and Mohenjo-daro this number is very small, which is evidently due to the limited extent of the excavation.

I am very much indebted to my Director, Dr. B. S. Guha, for giving me the opportunity to work on this collection as well as for his keen interest and encouragement given throughout the period of this work. My thanks are due to Dr. B. K. Chatterjee, Anthropologist, and Shri H. K. Bose, Assistant Anthropologist, for offering valuable suggestions in the preparation of this report and to Shri Bimal Chandra Dutta, Assistant, Department of Anthropology, for helping me in the routine-work connected with the identification, preservation and restorations of this collection.

DESCRIPTION OF THE BONES OF VERTEBRATE ANIMALS

A. Class : Pisces

Order : Teleostei

1. One abdominal vertebra. Unstratified. (HST 1-1132.)

This vertebra appears to belong to some species of carp, but it is difficult to identify it generically as distinctive features are not well-marked.

B. Class: Reptilia

Order: Chelonia

Family: Trionychidae

Lissemys punctata (Bonnaterre), forma *typica*

1. One fragment of epiplastron. From a mid-level of Period III. (HST 1-1635.) Pl. LXII, 1.
2. One fragment of epiplastron. From a mid-level of Period III. (HST 1-1635.)

The fragment of epiplastron, which is figured, is undoubtedly of a medium-sized individual of *L. punctata* forma *typica*. It resembles in pattern and vermiculations those of Mohenjo-daro recorded by Sewell and Guha[1] and of Harappā recorded by Prasad.[2]

Chitra indica (Gray)

1. One fragment of hypoplastron. From an early level of Period III. (HST 1-1317.) Pl. LXII, 2.
2. One fragment of hypoplastron. From an early level of Period III. (HST 1-1317.)
3. One fragment of hypoplastron. From an early level of Period III. (HST 1-1317.)
4. One fragment of hypoplastron. From an early level of Period III. (HST 1-1317.)
5. One fragment of hypoplastron. From an early level of Period III. (HST 1-1622.)
6. One fragment of hypoplastron. From an early level of Period III. (HST 1-1622.)

[1] Sewell and Guha, *op. cit.*, p. 663.
[2] Prasad, *op. cit.*, p. 14.

7. One fragment of hypoplastron. From an early level of Period III. (HST 1-1622.)
8. One fragment of carapace. From an early level of Period III. (HST 1-1374.)

Several fragments of hypoplastron excavated from the above-mentioned area are charred, which indicates that this species of turtle was probably used as food.

Remains of this species are also recorded from Mohenjo-daro[1] and Harappa.[2]

Trionyx gangeticus Cuvier

1. One fragment of hypoplastron. From an early level of Period III. (HST 1-1628.) Pl. LXII, 3.
2. One fragment of hypoplastron. From an early level of Period III. (HST 1-1628.)
3. One fragment of hypoplastron. From an early level of Period III. (HST 1-1628.)
4. One fragment of hypoplastron. From an early level of Period III. (HST 1-1628.)

All the fragments excavated from the above area appear to belong to adult individuals and are charred.

Remains of this species were also recorded from Mohenjo-daro[3] and Harappā.[4]

Order: Ophidia

1. Two abdominal vertebrae. Unstratified. (HST 1-915.)

The above-mentioned vertebrae belong to some species of the snake, but it is difficult to identify it generically, as distinctive features are not well-marked. The zygosphene, a wedge-like process on the anterior side of the neural arch, and the zygantrum, a depression on the posterior surface of the neural arch, are well-marked in both.

C. Class Mammalia

Order: Perissodactyla

Family: Equidae

Equus caballus Linnaeus

(The Horse)

1. One proximal fragment of the third or large left metatarsal. From a late level of Period II. (HST 1-1610.) Pl. LXII, 4.
2. One proximal fragment of the third or large metacarpal. From a late level of Period II. (HST 1-1610.)
3. One distal fragment of the right radius and ulna. From a late level of Period II. (HST 1-1610.) Pl. LXII, 5 and 6.

The skeletal remains of this animal correspond well to the specimen of the modern horse present in the collection of the Department. Both the fragments of metatarsal as well as metacarpal bear roughened margins for the attachment of split bones. The articular surface of the distal fragment of the right radius and ulna is also similar to that of the modern horse.

The shape, size and configuration of the three fragments mentioned above closely resemble the modern horse, and there cannot be any doubt in referring them to *Equus caballus* such as is found in India at the present day.

---

[1] Sewell and Guha, *op. cit.*, p. 663.
[2] Prasad, *op. cit.*, p. 14.
[3] Sewell and Guha, *op. cit.*, p. 662.
[4] Prasad, *op. cit.*, p. 15.

Order : Proboscidea

Family : Elephantidae

Elephas Maximus Linnaeus

(The Indian Elephant)

1. One tip of small tusk of a young one. From an early level of Period III. (HST 1-620.) Pl. LXII, 7.

2. One tip of small tusk of a young one. From an early level of Period IV. (HST 1-688.)

3. One pisiform bone of the left fore-foot. From an early level of Period IV. (HST 1-1554.) Pl. LXII, 8.

Although these are the only remains so far obtained of this animal, there cannot be any doubt that the inhabitants were well acquainted with the elephant. The find of a part of the skeleton, besides a few pieces of ivory, shows that the animal actually lived in this region.

Remains of the Indian elephant were also recorded by Sewell and Guha from Mohenjo-daro[1] while there is no record from Harappā.

Order : Artiodactyla

Family : Bovidae

Bos indicus Linnaeus

(The Zebu or Domestic Humped Cattle of India)

1. One fragment of a proximal extremity of the right radius. From the accumulation following the erosion of Period II. (HST 1-1588.)

2. One left calcaneum complete. It bears cut-marks. From the accumulation following the erosion of Period II. (HST 1-1588.)

3. One fragment of the vertical ramus of the left mandible with condyle and coronoid process. It has got marks of cuts by sharp instruments. From the accumulation following the erosion of Period II. (HST 1-1589.)

4. One fragment of the lower jaw without body (corpus mandibulae). From the accumulation following the erosion of Period II. (HST 1-1589.)

5. One fragment of horizontal ramus without body (corpus mandibulae). It bears cut-marks. From the accumulation following the erosion of Period II. (HST 1-1589.)

6. One fragment of the left upper jaw with first and second premolars. It bears marks of cuts. From the accumulation following the erosion of Period II. (HST 1-1589.)

7. One fragment of the spine of thoracic vertebra. It bears signs of cuts and charring. From the accumulation following the erosion of Period II. (HST 1-1589.)

8. One fragment of the shaft of radius and ulna. It is charred and bears signs of cuts. From the accumulation following the erosion of Period II (HST 1-1589.)

9. One fragment of the shaft of rib. It is charred. From the accumulation following the erosion of Period II. (HST 1-1589.)

10. One fragment of the left tibia with distal extremity. From the accumulation following the erosion of Period II. (HST 1-1589.)

11. One incomplete right calcaneum. From the accumulation following the erosion of Period II. (HST 1-1589.)

[1] Sewell and Guha, *op. cit.*, p. 653.

12. One fragment of the ramus of lower jaw. From the accumulation following the erosion of Period II. (HST 1-1589.)

13. One fragment of the shaft of thoracic rib. From the accumulation following the erosion of Period II. (HST 1-1591.)

14. One fragment of the shaft of femur. From the accumulation following the erosion of Period II. (HST 1-1591.)

15. One fragment of the shaft of metatarsal. From the accumulation following the erosion of Period II. (HST 1-1589.)

16. One fragment of the shaft of femur. It bears marks of cuts. From the accumulation following the erosion of Period II. (HST 1-1591.)

17. One proximal fragment of the right metacarpal. It bears marks of cuts. From the accumulation following the erosion of Period II. (HST 1-1592.)

18. One fragment of the shaft of metatarsal. It bears signs of cuts. From the accumulation following the erosion of Period II. (HST 1-1592.)

19. One fragment of the mandible. It bears signs of cuts. From the accumulation following the erosion of Period II. (HST 1-1592.)

20. One proximal fragment of the shaft of metacarpal. From the accumulation following the erosion of period II. (HST 1-1592.)

21. One fragment of shaft of metacarpal. It bears marks of cuts. From the accumulation following the erosion Period II. (HST 1-1592.)

22. One fragment of the medial condyle of the right humerus. It is charred and has cut-marks. From the accumulation following the erosion of Period II. (HST 1-1594.)

23. Right upper first premolar. From the accumulation following the erosion of Period II. (HST 1-1594.)

24. One left upper second premolar. From the accumulation following the erosion of Period II. (HST 1-1594.)

25. Body of the thoracic vertebra. It bears marks of cuts. From the accumulation following the erosion of Period II. (HST 1-1594.)

26. One left second incisor tooth of the lower jaw. From the accumulation following the erosion of Period II. (HST 1-1593.)

27. One fragment of the shaft of humerus with nutrient foramen. From the accumulation following the erosion of Period II. (HST 1-1595.)

28. One proximal fragment of right radius. It bears marks of cuts. From the accumulation following the erosion of Period II. (HST 1-1595.)

29. One fragment of the right scapula. From the accumulation following the erosion of Period II. (HST 1-1596.)

30. One fragment of the shaft of radius. From the accumulation following the erosion of Period II. (HST 1-1596.)

31. One fused second and third tarsal, i.e. middle and external cuneiform of a young one. It is charred. From the accumulation following the erosion of Period II. (HST 1-1598.)

32. One fragment of the left scaphoid. From the accumulation following the erosion of Period II. (HST 1-1598.)

33. One fragment of the thoracic vertebra with a portion of body and transverse process. It bears cut-marks. From the accumulation following the erosion of Period II. (HST 1-1598.)

34. One fragment of the shaft of a left radius and ulna fused. It bears cut-marks. From the accumulation following the erosion of Period II. (HST 1-1598.)

35. One left femur with head, tuberosity and supra-condyloid fossa. From the accumulation following the erosion of Period II. (HST 1-1598.)

36. One fragment of the third and fourth metatarsal with distal extremity. It is charred. From the accumulation following the erosion of Period II. (HST 1-1597.)

37. One fragment of the shaft of left radius and ulna. From the accumulation following the erosion of Period II. (HST 1-1598.)

38. One fragment of the shaft of thoracic rib. It bears cut-marks. From the accumulation following the erosion of Period II. (HST 1-1598.)

39. One fragment of the proximal extremity of thoracic rib with head, neck and tuberosity. It bears marks of cuts. From the accumulation following the erosion of Period II. (HST 1-1598.)

40. One fragment of the spine of thoracic vertebra. From an early level of Period II. (HST 1-1599.)

41. One fragment of the distal shaft of left humerus. It bears cut-marks. From the accumulation following the erosion of Period II. (HST 1-1600.)

42. One fragment of the shaft of femur. From an early level of Period II. (HST 1-1603.)

43. One fragment of the shaft of humerus. From an early level of Period II. (HST 1-1603.)

44. One fragment of the lower jaw. From an early level of Period II. (HST 1-1603.)

45. One fragment of the cervical vertebra with body. It bears cut-marks. From a late level of Period II. (HST 1-1606.)

46. One fragment of the third phalanx of fore-foot. From a late level of Period II. (HST 1-1606.)

47. One fragment of the right calcaneum. From a late level of Period II. (HST 1-1606.)

48. One epiphysis of vertebra. From a mid-level of Period II. (HST 1-1529.)

49. One fragment of the horn-core of a young one. From a late level of Period II (HST 1-1562.)

50. One distal fragment of the shaft of right humerus. From a late level of Period II (HST 1-1562.)

51. One pisiform bone. From a late level of Period II. (HST 1-1607.)

52. One fragment of the lower jaw. From a late level of Period II. (HST 1-1607.)

53. One thoracic vertebra with incomplete body, transverse process and neural arch. It bears marks of cuts. From a late level of Period II. (HST 1-1613.)

54. One thoracic vertebra (spinous process broken). From a late level of Period II (HST 1-1616.)

55. One proximal fragment of the left metacarpal. From a late level of Period II (HST 1-1609.)

56. One fragment of the thoracic rib. From a late level of Period II. (HST 1-1614.)

57. One fragment of the shaft of metacarpal. From a late level of Period II. (HST 1-1609.)

58. One spine of thoracic vertebra. From a late level of Period II. (HST 1-1616.)

59. One left lower first molar. From an early level of Period II. (HST 1-1629.)

60. One fragment of lumber vertebra with articular facet and a part of spine. From an early level of Period II. (HST 1-1629.)

61. One fragment of a rib. From an early level of Period II. (HST 1-1629.)

62. One distal fragment of right tibia. From a mid-level of Period II. (HST 1-1416.)

63. One fragment of the shaft of thoracic rib. From an early level of Period II. (HST 1-1629.)

64. One fragment of the shaft of right femur. From an early level of Period II. (HST 1-1624.)

65. One first phalanx of hind foot. From a late level of Period II. (HST 1-1363.)

66. One proximal fragment of thoracic rib. From an early level of Period II. (HST 1-1629.)

67. One distal extremity of the left tibia. From a late level of Period II. (HST 1-1615.)

68. One fragment of lower jaw. From a late level of Period II. (HST 1-1615.)

69. One right lower third molar. From a late level of Period II. (HST 1-1615.)

70. A fragment of the shaft of radius. From a late level Period II. (HST 1-1615.)

71. One fragment of the right upper first molar of a young one. From an early level of Period III. (HST 1-1617.)

72. One fragment of the head of femur. From an early level of Period III. (HST 1-1620.)

73. One proximal fragment of thoracic rib. It bears marks of cuts by sharp instruments From an early level of Period III. (HST 1-1619.)

74. One distal fragment of the shaft of right femur. From an early level of Period III. (HST 1-1621.)

75. One right astragulus of a young one. It bears cut-marks. From an early level of Period III. (HST 1-1622.)

76. One fragment of the distal extremity of left radius and ulna with a portion of styloid process. It is charred. From an early level of Period III. (HST 1-1622.)

77. One first phalanx of fore-leg. From an early level of Period III. (HST 1-1621.)



Antlers: 1-3, 5 and 6, Period III; 7 and 8, Period II; horn-core of a goat; 4, Period IV *(see pages 117-19)*

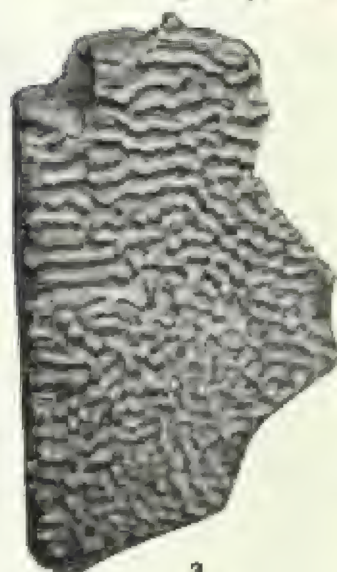
 To face plate LXIII



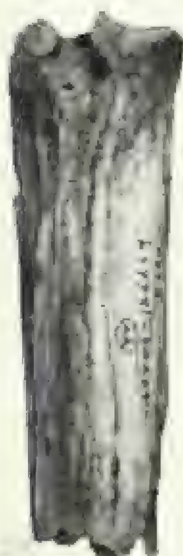
1



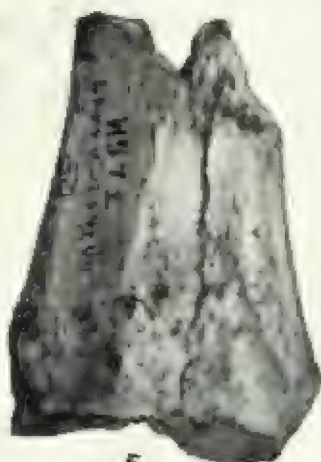
2



3



4



5



6



7



8

Animal-remains: 1-3 and 7, Period III; 4-6, Period II; 8, Period IV (see pages 108 and 109).
Sizes: 1, $\times 1\frac{1}{5}$; 2, $\times 1\frac{1}{12}$; 3, $\times 1\frac{1}{15}$; 4, $\frac{9}{10}$; 5 and 6, $\frac{1}{3}$; 7 and 8, $\frac{1}{4}$



9



10



11



12

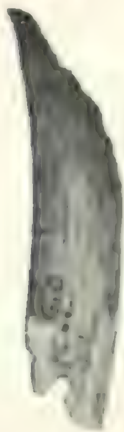


13

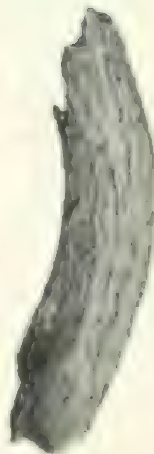


14

Animal-remains: 9 and 12, Period IV; 11 and 14, Period II; 10 and 13, modern, for comparison, (see pages 115 and 116). Sizes: 9-13, ½; 14, 1



15



16



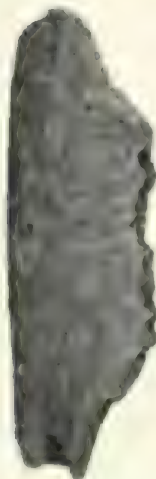
17



18



19



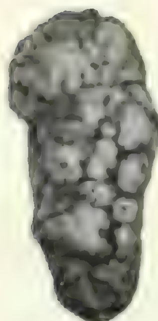
20



21



22



23



24

Animal-remains: 15, 18-21 and 24, Period III; 17, Period II; 16 and 23, from Harappā; and 22, from Mohenjo-daro, for comparison (see pages 117 and 118). Sizes: 15-18 and 20, ½; 19, 21-24, 1

78. One fragment of the shaft of tibia. From an early level of Period III. (HST 1-1622.)

79. One fragment of the shaft of humerus. From an early level of Period III. (HST 1-1625.)

80. One fragment of the shaft of femur. It bears marks of cuts. From an early level of Period III. (HST 1-1625.)

81. One fragment of the proximal extremity of thoracic rib with head, neck and tuberosity. From an early level of Period III. (HST 1-1625.)

82. One fragment of the shaft of thoracic rib. From an early level of Period III. (HST 1-1625.)

83. One fragment of the spine of thoracic vertebra. From an early level of Period III. (HST 1-1623.)

84. One fragment of the proximal end of femur with trochantric fossa. From an early level of Period III. (HST 1-1625.)

85. One fragment of the right upper molar of a young one. From an early level of Period III. (HST 1-1391.)

86. One fragment of the shaft of right humerus. From an early level of Period III. (HST 1-1628.)

87. One distal fragment of the shaft of left tibia of a young one without distal extremity. From an early level of Period III. (HST 1-1628.)

88. One proximal fragment of the left humerus. It is charred. From an early level of Period III. (HST 1-1628.)

89. One first phalanx of the fore-foot. From an early level of Period III. (HST 1-1628.)

90. One proximal fragment of the shaft of left radius. It is charred. From an early level of Period III. (HST 1-1628.)

91. One fragment of the right ventral arch of atlas vertebra. From an early level of Period III. (HST 1-1628.)

92. One proximal fragment of the right scapula with tuber scapulae and glenoid cavity. From an early level of Period III. (HST 1-1628.)

93. One right astragulus of a young one. It is charred. From an early level of Period III. (HST 1-1628.)

94. One left astragulus of a young one. It is charred. From an early level of Period III. (HST 1-1628).

95. One distal fragment of the right humerus of a young one. It is charred. From an early level of Period III. (HST 1-1628.)

96. One proximal fragment of the shaft of ulna. From an early level of Period III. (HST 1-1628.)

97. One fragment of the distal end of first rib. It bears cut-marks. From an early level of Period III. (HST 1-1628.)

98. One fragment of the right pelvis with a portion of ischium. From an early level of Period III. (HST 1-1628).

99. One fragment of the left femur with distal end. It bears cut-marks by sharp instruments. From an early level of Period III. (HST 1-1628.)

100. One distal fragment of the left humerus. It has got many marks of cuts by sharp instruments. From an early level of Period III. (HST 1-1628.)

101. One distal fragment of metacarpal. From an early level of Period III. (HST 1-1628.)

102. One fragment of the shaft of rib. From an early level of Period III. (HST 1-1628.)

103. One fragment of the shaft of thoracic rib. From an early level of Period III. (HST 1-1628.)

104. One fragment of the right metatarsal bone without distal extremity. From an early level of Period III. (HST 1-1494.)

105. One left upper third premolar. From an early level of Period III. (HST 1-1627.)

106. One fragment of the horizontal ramus of lower jaw. From an early level of Period III. (HST 1-1626.)

107. One proximal fragment of the shaft of metacarpal. From an early level of Period III. (HST 1-1627.)

108. One fragment of the body of vertebra. From an early level of Period III. (HST 1-1626.)

109. One left upper second molar. From a mid-level of Period III. (HST 2-54.)

110. One lumber vertebra without transverse process and spine. From a mid-level of Period III. (HST 1-1605.)

111. One fragment of the proximal shaft of left tibia without proximal extremity. It bears cut-marks. From a mid-level of Period III. (HST 1-1632.)

112. One distal fragment of the left humerus without distal extremity. From a mid-level of Period III. (HST 1-1632.)

113. One right calcaneum of a young one. From an early level of Period III. (HST 1-1633.)

114. One fragment of the shaft of humerus of a young one. From an early level of Period III (HST 1-1637.)

115. One fragment of the shaft of left humerus. It bears marks of cuts. From a mid-level of Period III. (HST 1-1631.)

116. One first molar of the right upper jaw. From a mid-level of Period III. (HST 1-1635.)

117. One fragment of the lateral condyle of femur. From a mid-level of Period III. (HST 1-1630.)

118. One complete shaft of right femur without proximal and distal extremities. From an early level of Period III. (HST 1-1359.)

119. One fragment of the cervical vertebra. From an early level of Period III. (HST 1-1554.)

120. One fragment of the shaft of femur. From an early level of Period III. (HST 1-1554.)

121. One fragment of a thoracic vertebra with body. From an early level of Period III. (HST 1-1554.)

122. One fragment of the right astragulus. From an early level of Period III. (HST 1-1554.)

123. One fragment of the shaft of rib. From an early level of Period III. (HST 1-1554.)

124. One proximal fragment of a rib. From an early level of Period III. (HST 1-1554.)

125. One fragment of the first phalanx of fore-foot. From an early level of Period III. (HST 1-1554.)

126. One fragment of the shaft of ulna. From an early level of Period III. (HST 1-1554.)

127. One fragment of the shaft of left calcaneum. From a mid-level of Period III. (HST 1-1639.)

128. One fragment of the left calcaneum. From an early level of Period III. (HST 1-1640.)

129. One fragment of the right lower jaw with mental foramen. It bears marks of cuts. From a mid-level of Period III. (HST 1-1641.)

130. One fragment of the left horizontal ramus of lower jaw with third premolar and first, second and third molars of a young one. From a mid-level of Period III. (HST 1-1641.)

131. One fragment of the sacrum with ventral foramen. From an early level of Period III. (HST 1-1601.)

132. One fragmentary part of the shaft of femur. From an early level of Period III. (HST 1-1621.)

133. One fragment of a molar tooth. From a late level of Period III. (HST 1-1643.)

134. One complete right tibia. From an early level of Period IV. (HST 1-1545.)

135. One fragment of the left metacarpal with proximal extremity. From an early level of Period IV. (HST 1-1642.)

136. One fragment of the left upper jaw with third premolar and first molar. From an early level of Period IV. (HST 1-1648.)

137. One fragment of the ramus of lower jaw. From an early level of Period IV. (HST 1-1649.)

138. One left upper second molar. From an early level of Period IV. (HST 1-1642.)

139. One right upper third premolar. From an early level of Period IV. (HST 1-1648.)

140. One left tibia without proximal extremity. From a late level of Period IV. (HST 2-108.)

141. One fragment of the proximal shaft of right humerus. From a late level of Period V (HST 2-107.)

142. One fragment of the shaft of radius with distal extremity. From an early level of Period V. (HST 1-1638.)

143. One fragment of the left scapula. It bears cut-marks. Unstratified. (HST 1-1650.)

144. One fragment of the right pelvis with acetabulum. From an early level of Period III (HST 1-1653.)

145. One fragment of the shaft of femur. From an early level of Period III. (HST 1-1654.)

146. One fused second and third tarsal, i.e. middle and external cuneiform, of a young one. From an early level of Period III. (HST 1-1655.)

147. One fragment of the molar tooth. From an early level of Period III. (HST 1-1656.)

148. One lower left first molar of a young one. From a mid-level of Period III. (HST 1-1652.)

The remains of the humped cattle listed above, including the long bones, are very fragmentary in nature and are of no use for exact measurements. The great frequency with which the remains of *Bos indicus* have been met with during the excavation as compared with the finds of other animals of the site indicates that the inhabitants probably used to maintain large herds of this animal. In a number of cases the remains are that of the young ones. Out of one hundred and fortyeight fragments of bones examined, twenty fragments are charred and twentytwo bear on them definite signs of cuts by sharp instruments which tend to prove that the people probably slaughtered them for food.

Prasad distinguishes two distinct types of humped cattle from Harappā: (i) a large massive form probably of the type of long-horned humped cattle and (ii) a small form with short horns which probably represents the humpless variety.[1] The remains from Hastināpura, which have been carefully examined, closely resemble the smaller, humpless, short-horned variety of Harappā, as is now met with in India.

From the very close structural resemblance between the skeletal remains excavated at Hastināpura and those of the modern domestic humped cattle of India present in the collection of the Department of Anthropology, it is evidently clear that the Hastināpura remains are as those of the domesticated cattle now found in India.

These skeletal remains of *Bos indicus* from Hastināpura resemble very closely those of Mohenjo-daro[2] and Harappā.[3]

Bos (Bubalus) bubalis Linnaeus

(The Indian Domestic Buffalo)

1. One proximal fragment of the left metacarpal. From the accumulation following the erosion of Period II. (HST 1-1533.)

2. One fragment of the proximal end of left femur. From the accumulation following the erosion of Period II. (HST 1-1597.)

3. One fragment of the distal extremity of left humerus with medial and lateral condyles. It bears marks of cuts. From an early level of Period II. (HST 1-1604.)

4. One proximal fragment of left femur. From a late level of Period II. (HST 1-1614.)

5. One distal fragment of tibia. From an early level of Period III. (HST 1-1634.)

6. One fragment of the shaft of humerus. From an early level of Period III. (HST 1-1374.)

7. One fragment of the shaft of humerus. From an early level of Period III. (HST 1-1375.)

8. One fragment of the shaft of femur. From a mid-level of Period III. (HST 1-1630.)

9. One right lower third molar. From an early level of Period III. (HST 1-1626.)

10. One proximal fragment of the left ulna with olecranon process. From an early level of Period IV. (HST 1-1649.)

11. One left third and fourth metacarpal bone. It has got chopping at its distal extremity. From a mid-level of Period IV. (HST 1-1647.) Pl. LXIII, 9.

12. One fragment of left radius without distal extremity. From a mid-level of Period IV. (HST 1-1645.)

None of the above bones of this animal is complete and no measurements can, therefore, be taken for comparison, except the left third and fourth metacarpal bone of the fore-foot, the measurements of which is given below for comparison with those of a recent specimen in the Department. Its photograph along with that of a modern specimen is reproduced on pl. LXIII, 9 and 10 respectively.

[1] Prasad, *op. cit.*, p. 37.

[2] Sewell and Guha, *op. cit.*, p. 654.

[3] Prasad, *op. cit.*, pp. 32-37.

Left third and fourth metacarpal bone	Length	Proximal width	Median width	Distal width
Hastināpura	200 mm.	68 mm.	39 mm	..
Modern specimen (in the Deptt. of Anthropology)	195 mm.	65 mm.	37 mm.	67 mm.

The find of a limited number of fragments of the bones of *Bos* (*Bubalus*) *bubalis* indicates that the inhabitants probably did not maintain large herds of the *Bos* (*Bubalus*) *bubalis* (the Indian buffalo) as compared with *Bos indicus*.

Altogether twelve fragments of the bones have been recorded of this animal from Hastināpura. Two of these comprising limb-bones bear on them definite signs of cuts, again showing that most probably they were slaughtered for food.

These remains of the buffaloes show very close structural resemblance with those of the modern domestic buffalo. Thus the Hastināpura remains are closely akin to the modern Indian domesticated race of buffalo. They are also similar to those of Mohenjo-daro[1] and Harappā.[2]

Ovis vignei Blyth, *race domesticus*

(The Domestic Sheep)

1. One distal fragment of left femur. From the accumulation following the erosion of Period II. (HST 1-1594.) Pl. LXIII, 11.
2. One fragment of the shaft of right radius. It bears marks of cuts. From a late level of Period II. (HST 1-1611.)
3. One fragment of the shaft of radius. From a late level of Period II. (HST 1-1612.)
4. One fragment of the shaft of femur. From a late level of Period II. (HST 1-1610.)
5. One fragment of the shaft of femur. From a mid-level of Period II. (HST 1-1529.)
6. One complete thoracic vertebra. From the accumulation following the erosion of Period II. (HST 1-1298.) Pl. LXIII, 14.
7. One complete thoracic vertebra. From the accumulation following the erosion of Period II. (HST 1-1298.)
8. One complete thoracic vertebra. From the accumulation following the erosion of Period II. (HST 1-1298.)
9. One complete thoracic vertebra. From the accumulation following the erosion of Period II. (HST 1-1397.)
10. One fragment of the illium of left pelvis. From a mid-level of Period III. (HST 1-1639.)
11. One distal portion of the shaft of left humerus. From an early level of Period III. (HST 1-1626.)
12. One right upper first molar. From a late level of Period III. (HST 1-1643.)
13. One left upper second premolar of a young one. From a mid-level of Period III. (HST 1-1333.)
14. One fragment of the left radius without distal extremity. From an early level of Period IV. (HST 1-1646.) Pl. LXIII, 12.
15. One fragment of the shaft of metacarpal. From an early level of Period III. (HST 1-1657.)
16. One fragment of the shaft of radius. From an early level of Period III. (HST 1-1658.)

[1] Sewell and Guha, *op. cit.*, p. 659.
[2] Prasad, *op. cit.*, pp. 32-37.

17. One proximal fragment of the ulna with a portion of olecranon process and semi-lunar notch. From the burnt ashy layer ending Period III. (HST 1-1049.)

18. One fragment of the shaft of tibia. It is charred. From the burnt ashy layer ending Period III. (HST 1-1049.)

19. One fragment of the distal extremity of right tibia. Unstratified. (HST 1-1659.)

20. One fragment of the upper molar tooth. From an early level of Period IV. (HST 1-1660.)

The remains of domestic sheep, as mentioned above, are very fragmentary. Not a single complete bone or a skull is available, and it is difficult, therefore, to be certain about the sizes of this species or to take particular measurements for comparison.

The limb-bones, too, are very fragmentary. The photographs of some of the better-preserved remains are reproduced on pl. LXIII, 11, 12 and 14 along with that of a modern specimen (pl. LXIII, 13.)

Fragments of the bones from Hastināpura closely resemble those of the remains of sheep from Harappā. Out of twenty fragments three fragments bear definite marks of cuts by sharp instruments, and one fragment of the bone is charred, pointing out that the people most probably slaughtered them for food.

Remains of the sheep were also recorded from Mohenjo-daro[1] but no specific name was given there. Prasad, however, designated such remains from Harappā as *Ovis vignei* Blyth, race *domesticus*,[2] and the same name has been retained for the present collection.

Capra hircus aegagrus Erxleben

(The Domestic Goat)

1. One incomplete horn-core with tip broken. From a late level of Period IV. (HST 1-792.) Pl. LXI, 4.

2. One fragment of the horn-core. From an early level of Period III. (HST 1-1636.) Pl. LXIV, 15.

3. One fragment of the horn-core. From an early level of Period III. (HST 1-1646.)

4. One left lower jaw without the body (corpus mandibulae) and coronoid process of a young one. From a late level of Period V. (HST 1-19.)

As compared with the skeletal remains of domestic sheep (*Ovis vignei*), the skeletal remains of the goat from Hastināpura are very small in number.

The horn-cores of the goat are unfortunately very fragmentary, but they resemble those of a goat figured by Duerst[3] and the inner cavity of the core of the horn is, like that of Anau, very extensive. They also resemble that of similar species from Harappā.[4]

The photograph of a horn-core from Hastināpura, along with one from Harappā (Mound D, sq. G 31, depth 6-9 ft.) in the collection of the Department of Anthropology, is reproduced on pl. LXIV, 15 and 16 respectively.

As regards the selection of a name for the Domestic Indian Goat, the present author differs from Prasad[5] who refers to them as *Capra aegagrus* Gmelin, race *indicus*. It is proposed to redesignate all the Indian Domestic Goats as *Capra hircus aegagrus*, and the same has been applied to the present remains of goats from Hastināpura. Prasad[6] as well as Blanford[7] regard *Capra aegagrus* as the parent form, from which all domestic races of goats are derived. Linnaeus, however, used the name *Capra hircus* for the domestic goat and regarded it as the principal species from which domestic races

---

[1] Sewell and Guha, *op. cit.*, p. 659.

[2] Prasad, *op. cit.*, p. 49.

[3] Duerst, *op. cit.*, pl. LXXVI, 14.

[4] Prasad, *op. cit.*, pl. VI, 1.

[5] *Ibid.*, p. 47.

[6] *Ibid.*, p. 48.

[7] W. T. Blanford, *Fauna of British India: Mammalia* (London, 1891), p. 503.

were derived.[1] Pocock also referred to *Capra hircus* as the parent species.[2] Recently Ellerman and Morrison-Scott regarded *aegagrus* as a race of *Capra hircus* instead of considering the former as a full species;[3] he gave *aegagrus* the rank of a sub-species or race of the *Capra hircus* and introduced the name *Capra hircus aegagrus* for all the domestic goats including even the domestic goats of India. Even Blanford, as Prasad says,[4] used the name *Capra hircus aegagrus* for the wild goat of Persia, but he gave *aegagrus* the status of a full species in his *Fauna of British India: Mammalia* and considered that all the domestic goats were derived from it,[5] and Prasad followed him.[6]

From the above discussion it is evidently clear to consider *Capra hircus* as the parent species from which all the domestic goats are derived and the *aegagrus* as sub-specific name or race for all the domesticated goats of India. It is, therefore, proposed to classify all domestic goats by the name *Capra hircus aegagrus*, and the same name has been given to the remains of goats from Hastināpura.

Family: Suidae

Sus cristatus Wagner var. *domesticus* Rolleston

(The Indian Domestic Pig)

1. One proximal fragment of the left humerus with head and lateral tuberosity. From a late level of Period II. (HST 1-1616.) Plate LXIV, 17.
2. One proximal fragment of the right femur. From the accumulation following the erosion of Period II. (HST 1-1598.)
3. One mandibular symphysis with incisor teeth. From an early level of Period III. (HST 1-1258.) Pl. LXIV, 18.
4. One fragment of canine tooth of the left upper jaw. From an early level of Period III. (HST 1-1258.) Pl. LXIV, 19.
5. One third molar of the left upper jaw. From an early level of Period III. (HST 1-1391.) Pl. LXIV, 24.
6. One proximal fragment of the left ulna with olecranon process. From an early level of Period III. (HST 1-1628.)
7. One proximal fragment of the scapula with glenoid cavity and tuber scapulae. From an early level of Period III. (HST 1-1628.)
8. One proximal fragment of the scapula with glenoid cavity and tuber scapulae. From an early level of Period III. (HST 1-1640.)
9. One fragment of the shaft of radius. From an early level of Period III. (HST 1-1625.)
10. One fragment of the vertebra with a portion of body and pedicle. From an early level of Period III. (HST 1-1617).
11. One proximal fragment of the right ulna. From a mid-level of Period III. (HST 1-1631.)
12. One fragment of the maxilla. From an early level of Period III. (HST 1-1374.)
13. One fragment of scapula. It bears cut-marks. From an early level of Period III. (HST 1-1374.)
14. One fragment of the left scapula with glenoid cavity and neck and tuber scapulae. It bears marks of cuts. From an early level of Period III. (HST 1-1258.)
15. One left second incisor tooth of a young one. From an early level of Period III. (HST 1-1619.)
16. One fragment of the shaft of thoracic rib. From a late level of Period III. (HST 1-1644.)

[1] C. Linnaeus, *Systema Nature* (1758), 10th ed., I, p. 68.

[2] R. I. Pocock, 'Goats', *Natural History*, Charles Tate-Regan, p. 681.

[3] J. R. Ellerman and T. C. Morrison-Scott, *Checklist of Palaearctic and Indian Mammals from 1758-1946*, Brit. Mus. Nat. Hist. (1952), p. 404.

[4] Prasad, *op. cit.*, p. 48.

[5] Blanford, *op. cit.*, p. 502.

[6] Prasad, *op. cit.*, p. 48.

17. One fragment of the shaft of thoracic rib. It has cut-marks on it. From an early level of Period III. (HST 1-1617.)

18. One third metacarpal of the fore-foot. It bears marks of cuts. From a mid-level of Period IV. (HST 1-1661.)

19. One proximal fragment of the left ulna. It bears many cut-marks. From an early level of Period III. (HST 1-1662.)

20. One second phalanx of the fore-foot. From an early level of Period III. (HST 1-1663.)

21. Two fragments of the shaft of ribs. (HST 1-1666.)

22. One fragment of the horizontal ramus of the left lower jaw without teeth. From an early level of Period III. (HST 1-1664.) Pl. LXIV, 20.

23. One body (corpus mandibulae) of the mandible without incisor teeth. From a mid-level of Period III. (HST 1-1665.) Pl. LXIV, 21.

These remains of the pig from Hastināpura are all very fragmentary and do not allow a detailed comparison with others, but a careful examination leads us to refer them to the domestic race of the Indian pig, *S. cristatus*. The bones, for example the scapulae, metacarpals and phalanges as well as the limb-bones, are rather small, indicating that they belong to young individuals. However, the photographs of some of the better-preserved and conspicuous bones, such as the fragment of mandible, fragment of upper canine tooth or tusk and the fragment of humerus, not figured by Prasad or by Sewell and Guha, are reproduced on pl. LXIV, 17-21.

Most of the teeth of *Sus cristatus* are poorly preserved. The only better-preserved tooth in this collection is the left third molar of upper jaws, the measurements of which are given below for comparison with those of Harappā and Mohenjo-daro and of a recent specimen in the Indian Museum.

Upper third molar	Hastināpura	Mohenjo-daro	Harappa	Modern (Indian Museum)
Length ...	40 mm.	40 mm.	44 mm.	39 mm.
Maximum width ...	18 mm.	18·5 mm.	20 mm.	20 mm.

The molar tooth from Hastināpura resembles those from Harappā and Mohenjo-daro and of a domestic pig in the Indian Museum; that from Mohenjo-daro (SD. 1586; pl. LXIV, 22) is more worn out than the one from Harappā (D.S. 27; pl. LXIV, 23) or the one from Hastināpura (pl. LXIV, 24). Amongst the remains two bones are charred and four bear definite marks of cuts by sharp instruments.

Family: Cervidae

Cervus (Rucervus) duvaucelli Cuvier

(The *bārasingā*)

1. Portion of an antler. From an early level of Period III. (HST 1-1337.) Pl. LXI, 1.

2. Tip of an antler. Polished. From an early level of Period III. (HST 1-1541.) Pl. LXI, 2.

3. Fragment of an antler. Polished. From an early level of Period III. (HST 1-870.) Pl. LXI, 3.

4. Tip of an antler. Charred and polished. From an early level of Period III. (HST 1-1435.) Pl. LXI, 5.

5. Fragment of an antler. From the earliest level of Period III. (HST 1-1525.) Pl. LXI, 6.

6. Fragment of an antler. Sawn off. From the latest level of Period II. (HST 1-1331.) Pl. LXI, 7.

7. Portion of an antler. Sawn through the pedicle and at above the base. From the latest level of Period II. (HST 1-1336.) Pl. LXI, 8.

These fragments of antler of the *bārasiṅgā* have been carefully compared with those of *Cervus (Rucervus) duvaucelli* Cuvier, in the Indian Museum collection and those from Harappā. As they have been found to tally with one another, they have been assigned to this species. Fortunately the pedicle in one of the fragments (HST 1-1336, pl. LXI, 8) is well-preserved, showing that the antler was sawn off through the pedicle as well as slightly above the base and removed from the animal after it had been killed. The circumference of this specimen near the base is about 5 in., and this indicates that the antler was of a fully adult specimen.[1]

Specimen no. HST 1-1331 (pl. LXI, 7) was sawn off from the antler, and it bears several cut-marks on it. Another fragment (HST 1-1337, pl. LXI, 1) likewise shows its removal from the antler by sawing, the fragment terminating below in a cut surface. The three specimens (HST 1-870, 1193 and 1541), which are tips of antlers, are polished and rounded (pl. LXI, 2, 3 and 5).

As stated above, it is significant that, as in the case of Mohenjo-daro, the only remains of the deer available at Hastināpura are the antlers. If this animal had been living in this region, at least some of the teeth and other parts of body should have been preserved. From the negative evidence it can be assumed that the antlers were probably imported from some other region.

Prasad records this species from Harappā,[2] which, however, has not been noted at Mohenjo-daro, though Sewell and Guha mention four other different species of stags.[3] They remark: 'The presence of stags is strongly in favour of the view that stags' horn was in past at Mohenjo-daro a commercial commodity and was imported for medicinal or other purposes.'[4]

J. Plant-remains[5]

(i) *Introduction*

The plant-remains dealt with here came from two distinct occupational periods, viz. Periods II and III, which have been dated respectively from *circa* 1100 to *circa* 800 B.C. and the early sixth to the early third century B.C. (above, p. 23). All the plant-remains were found in a charred state except the mud-plaster. In spite of the fragile and delicate nature of the materials, it has been possible to identify them all. Altogether four different plant-materials were recovered. One was charred cereal which proved to be rice (*Oryza* sp.); mixed with it were a few pieces of charcoal of sissoo (*Dalbergia sissoo*). The remaining charcoal was of kurchi (*Holarrhena antidysenterica*). The mud-plaster contained remains of wild cane (*Saccharum spontaneum*) mixed with rice-husk.

The importance of the find lies in the fact that this is the oldest record of rice in India, maybe the oldest record in the world at the present time. The wild cane is equally interesting owing to the attention it has recently received from the plant-breeders. The two timbers are also now well-known for their commercial importance.

(ii) *Material*

The Superintendent, Excavations Branch, Department of Archaeology, New Delhi, sent us the following material:—

[1] For comparison of measurements see T. Bentham, *Illustrated Cat. Asiatic Horns and Antlers in the Indian Museum* (Calcutta, 1908), pl. 85, 86.

[2] Prasad, *op. cit.*, p. 53.

[3] Sewell and Guha, *op. cit.*, pp. 559-60.

[4] *Ibid.*, p. 672.

[5] Contributed by Dr. K. A. Chowdhury and Shri S. S. Ghosh, Forest Research Institute, Dehra Dun.

1. Packet marked HST 1-1573 contained a black mass of charred cereal and a few chips of charcoal. This was from a pit of Period II ascribable to the ninth century B.C. The spikelets, grains and broken husks were all embedded in a black shiny substance appearing somewhat like a mass of coal-tar.

2. Packet marked HST 1-1580 contained portions of mud-wall showing vertical, and, in some cases, both vertical and horizontal, grooves. On the outer sides of the wall there were some broken pieces of cereal-husks embedded in the mud. Inside the hollow grooves some plant-remains were also found. The age of this material may be *circa* 800 B.C. (included in Period II).

3. Packet marked HST 1-1263 contained pieces of charcoal obtained from a pit of Period III ascribable to the latter half of the fifth century B.C.

(iii) *Methods of study*

In the case of charred cereal every attempt was first made to obtain as much information as possible on the morphological features. For this, very careful dissections were often necessary. But it was a difficult task to isolate the spikelets and grains from the hard tar-like mass. Often the spikelets and grains came off in pieces. These were immediately stuck on to a piece of plasticine. The idea was to keep trace of the broken pieces for the reconstruction of the cereal. The method of anatomical study is detailed below.

For mud-plaster, the technique used was similar to what had been developed by the authors earlier.[1] Some slight modifications were, however, necessary in special cases. Artschwager's[2] peel method was of considerable value, although a weaker acid and longer time had to be employed. At the outset only a few bits of plant-remains were recovered and studied after maceration. The general impression gathered was that it would probably be bits of plant-tissues belonging to some grasses. Attempts were then made to collect as much information as possible according to Artschwager's method and to see whether the early impression was correct or not. An examination of a large number of slides made possible a successful reconstruction of the original material and its final identification. The different tissues reconstructed are dealt with under the anatomical description (below, p. 126).

The microscopic examination of the charcoal by snapping method did not give very satisfactory results. Sections were, therefore, cut according to the general procedure followed by Jeffrey[3] and Maby[4] with some modifications. No treatment with hydrofluoric acid was possible as the material started crumbling off. Only repeated treatments with hot carbolic acid were given. The material was then put through double embedding. Here also celloidin in clove-oil gave far better results than celloidin in alcohol-ether. In fact, by the former method it was possible to cut a series of sections of charred grain on a rotary microtome.

Photomicrographs were taken through transmitted light. Some photomicrographs, however, could be obtained only by using phase contrast microscope.

---

[1] *Ancient India*, no. 7 (1951), p. 5.

[2] E. Artschwager, 'A comparative study of the stem epidermis of certain sugar cane varieties', *Jour. Agricultural Research*, 41 (1930), pp. 853-65.

[3] E. C. Jeffrey, *Anatomy of Woody Plants* (Chicago, 1917) and *Coal and Civilization* (New York, 1925).

[4] J. C. Maby, 'The identification of wood and wood charcoal-fragments', *The Analyst*, 57 (1932), pp. 2-8.

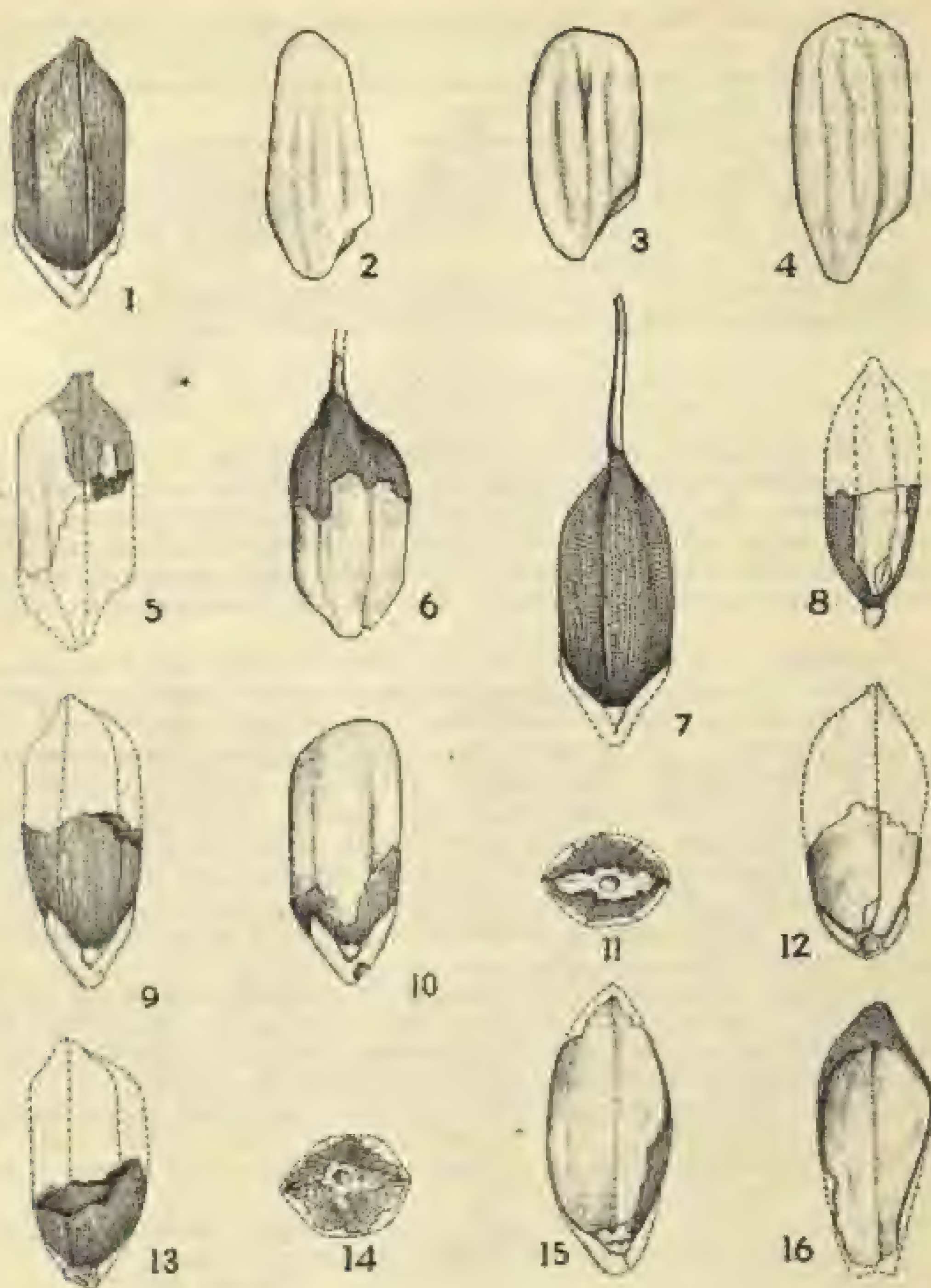


FIG. 33. *HST 1-1573, diagrammatic sketches: 1, complete spikelet; 2-4, grains; 5, part of spikelet with apiculus; 6 and 7, incomplete spikelets with distinct awns; 8, broken spikelet with exposed embryo; 9-11, broken spikelets showing position of sterile glumes and rachilla; 12, basal end of broken spikelet showing lodicule; 13-14, part of spikelet with scar in different views; 15 and 16, inside view of boat-shaped fertile glume and palea.* (×8)

(iv) *Results of study and identification*

(a) Material from HST 1-1573: charred cereal and charcoal chips

Charred cereal (fig. 33; pls. LXV and LXVI, 1-4)

MORPHOLOGICAL DESCRIPTION.—The charred cereals embedded in the black mass, show whole or broken spikelets adhering to each other. There is no stalk nor any pedicel. In other words there is no indication of inflorescence. Some scars showing attachment of the spikelet on the stalk are, however, noticeable (fig. 33, 11 and 14). *Spikelets* vary in size from 5-7 mm. in length and 2-2·7 mm. in breadth, each containing one single grain. *Sterile lemma* are paired, rather minute (1·7 mm. × ·5 mm. and 1·5 mm. × ·5 mm.), lanceolate in shape and arranged alternately. The outer surface is smooth and shiny. *Rachilla*, in well-preserved specimens, is expanded into an annular thickening appearing somewhat comma-shaped (pl. LXV, 4 and 10). *Fertile lemma* is boat-shaped with convex side outwards, 5-nerved and prolonged into an awn. Its outer surface is very striking and looks like chess-board pattern with hairs at places. *Palea* is also boat-shaped but 3-nerved and less convex and slightly smaller than the fertile lemma. *Apiculus* is thick and straight but the tridentate nature of the apex of the fertile lemma is seldom distinct (pl. LXV, 7). *Awn* has been seen only in a few cases. It is slender, up to 3·5 mm. in length (pl. LXV, 8). *Lodicules* are seen with difficulty due to charring. They disintegrate when dissected and are, therefore, better seen in serial cross-sections of spikelet (pl. LXVI, 2). *Caryopsis* or *grain* varies in shape and size, may be either flattened or somewhat puffed, oblong to elliptical showing longitudinal ridges and grooves. The grains are 4·16-5·54 mm. in length, 1·85-2·57 mm. in breadth and 1·2-1·98 mm. in thickness. The ratio L/B×T is 1·45. *Embryo* is not preserved but its position at the basal end of the grain is distinct (fig. 33, 8; pl. LXV, 15).

ANATOMICAL DESCRIPTION.—The general features of spikelet and grain as seen in cross- and longitudinal sections have been shown on pl. LXVI, 1-4. *Outer epidermis* is very characteristic, being an extremely thick-walled, wavy or sinuous layer. Hypoderm is composed of several rows of cells of thick-walled sclerenchymatous tissue (pl. LXVI, 2, 3 and 4). *Spongy parenchyma* cells are thin-walled and somewhat rectangular in shape. *Vascular bundles* remain embedded in the spongy parenchyma and show concentric arrangement. *Inner epidermis* is not distinguishable except in some serial sections. *Pericarp* is recognizable but all the cells of the layer are not discernible. *Epicarp* is usually distinct and characteristic (pl. LXVI, 1, 3 and 4). *Endosperm* occupies the major portion of the grain and consists of mainly thin-walled parenchymatous cells (pl. LXVI, 1 and 3). Starch grains have not been observed. Aleurone layer, which completely encloses the starch-parenchyma, is usually made up of large thin-walled cells. Hair scars are often visible at several places on the epidermal walls (pl. LXVI, 2).

IDENTIFICATION.—The fertile lemma and palea are the most important features of the cereal and give valuable clue to its identity. When the outer surfaces of the spikelet or the broken husk are rubbed with a needle or a scalpel, the coarse nature of the covering of the grain can be easily felt.[1] The anatomical structure of the outer epidermis is characterized by large cells arranged in parallel longitudinal rows. The cells are somewhat squarish in shape and their walls are extremely thick, sinuous or zigzag.[2] The epicarp is equally characteristic with its tangentially stretched cells. These anatomical features,

[1] A. L. Winton, *The Microscopy of Vegetable Foods* (New York, 1916).

[2] J. N. Hector, *Introduction to the Botany of Field Crops*, I (Johannesburg, 1936).

in addition to the general chess-board pattern of the entire outer surface,[1] indicate that the cereal belongs to the genus *Oryza* (rice). In this genus there are many species, some wild and others cultivated.[2] Attempts are now being made to study as many of them as possible. The results of this investigation will be published later in detail.

Charcoal chips mixed with grains (pls. LXVI, 5-8 and LXVII, 1-3)

GROSS FEATURE.—The chips are small, seldom exceeding ½ × ½ in. in size. There is no bark nor any pith. Splitting is difficult due to knots and twisted grain. The chips appear to belong to some dense, rather coarse, uneven-textured wood. Well-split end-surfaces show some wavy lines indicating bands of parenchyma in between fibrous tissues (pl. LXVI, 5). The gross features give the impression of a diffuse-porous wood.

MICROSCOPIC STRUCTURE.—*Growth rings* are indistinct. *Vessels* are hardly visible to the eye but distinct under the lens, small to moderately large, round to oval, mostly solitary, occasionally in radial multiples of 2-3, rather scanty in distribution (pls. LXVI, 6 and LXVII, 1); vessel lines are distinct; perforation plate simple, intervessel pits fairly large, not much crowded, oval to elliptical, sometimes confluent, with lenticular orifice (pl. LXVI, 8); vestured nature of the pits not always distinct; tyloses absent. *Parenchyma* cells are of two types—paratracheal and apotracheal; (*a*) paratracheals are very conspicuous, aliform to aliform confluent, often wavy (pls. LXVI, 6 and LXVII, 1); (*b*) apotracheals are mostly diffuse, usually single, uniformly distributed (pl. LXVII, 2). At places suggestions of initial or terminal parenchyma cells are noticeable. *Rays* are fine, distinct, rather closely spaced, 1-3 cells wide, 1-17 cells in height. The low rays occasionally show a tendency towards formation of *ripple-marks* (pl. LXVII, 3). *Fibres* semi-libriform to libriform, non-septate, round to oval to angular, irregularly arranged, often form thick bands, sometimes alternating with thick bands of parenchyma (pl. LXVII, 2).

IDENTIFICATION.—The characteristic anatomical features visible on the end-surface are, round to oval vessels, prominent aliform to aliform-confluent parenchyma and rather fine rays. These strongly suggest an affinity with leguminous timbers, particularly *Dalbergia* and *Pterocarpus*.[3] A comparative study of these shows that the present specimen mostly resembles *Dalbergia*[4] and especially *Dalbergia sissoo* (sissoo).

(b) Material from HST 1-1580: mud-plaster with straw (figs. 34-36; pls. LXVII, 4-8, and LXVIII)

GENERAL OBSERVATIONS.—As mentioned earlier, the mud-plaster consists of hardened clod of earth with longitudinal and horizontal grooves of varying sizes. The very look gives the impression that a wall made of thin, round plant-material arranged at right angles has been plastered with thick mud on both sides. In some specimens we have examined the mud has melted away from one side of the wall. The holes are now exposed, showing no original plant-material except its tiny bits sticking on to the inner side of the grooves. The diameters of these grooves vary from ¼ to $\frac{5}{16}$ in.

---

[1] K. A. Chowdhury and S. S. Ghosh, 'Rice in ancient India', *Science and Culture*, 19 (1953), pp. 207-09.

[2] D. Chatterjee, 'A modified key and enumeration of the species of *Oryza* Linn.', *Indian Journal of Agricultural Science*, 18 (1948), pp. 185-92.

[3] K. A. Chowdhury and S. S. Ghosh, 'Plant-remains from Harappā 1946', *Ancient India*, no. 7 (1951), p. 8.

[4] R. S. Pearson and H. P. Brown, *The Commercial Timbers of India*, I (Calcutta, 1932).

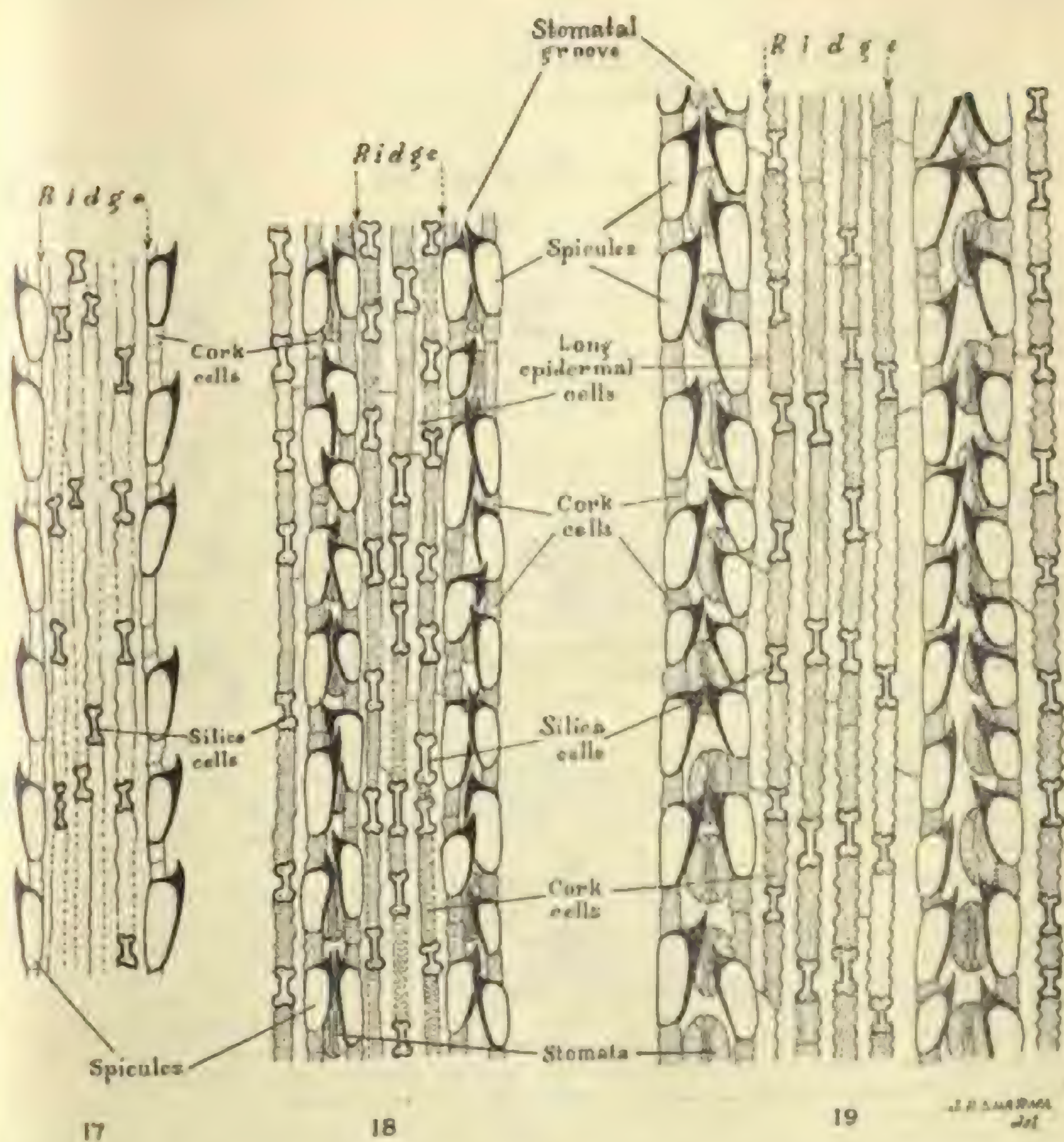


FIG. 34. *17 and 18, HST 1-1580, diagrammatic sketches: lower epidermis showing general features of different cells on the ridges and grooves* (×360); *19, diagrammatic sketch: lower epidermis of* Saccharum spontaneum *for comparison with 17 and 18.* (×360)

ANATOMICAL DESCRIPTION.—After an examination of slides under the microscope it has been thought advisable to divide them into different groups indicating their possible origin. For the sake of convenience, the anatomical details will be given here under four headings :—

A. Epidermal surfaces of leaf.
B. Epidermal surface of leaf-sheath.
C. Cross-section of a leaf-sheath (?).
D. Husks of cereal.

A. *Epidermal surfaces of leaf*

(i) LOWER.—There are two distinct patterns, indicating ridges and grooves as found in monocotyledonous leaf (fig. 34, 17-18; pl. LXVIII, 4-6). The layer below the ridge shows at places thick-walled sclerenchymatous cells (pl. LXVIII, 9). The vascular bundles, however, could not be observed. The general arrangement of fundamental (usually long) and differentiated (usually short) cell-elements is in parallel rows. The ridges are made up of two distinct alternating rows of cells. One row consists of transparent long epidermal cells. The other row contains fairly long cork and short silica cell-pairs, often arranged in an alternating fashion (fig. 34, 17 and 18; pl. LXVIII, 4-6). *Epidermal cells* are 94·25 μ or more long and 7·15 μ in breadth. Their walls are straight to wavy to somewhat corrugated but usually thin. On the peripheral zone of the ridge there are characteristic spicules or denticules with pointed or bent ends arranged in long rows (fig. 34, 17 and 18; pl. LXVIII, 4-7 and 10). The spicules are usually in very closely-spaced rows. In between the spicules, the cork cells number 1-3, usually 2 and rarely 1, may be a silica cell. In size the spicules vary from 16·25μ to 52μ in length, and 9·75μ to 13·0μ where they are broadest.

Silica cells are very characteristic and look like a halter or dumb-bell. They are uniformly distributed over the ridge. The two bulbs of the silica cells are usually connected by a very narrow, short neck. Sometimes silica cells with three bulbs are also met with (pl. LXVIII, 3). In size the silica cells are about 26·0μ in length, the bulbs being 7·8μ to 9·75μ and the neck 6·5μ to 9·75μ. When three-bulbed it may be up to 32μ in length. *Cork cells* (suberous cells) are rectangular with longer sides parallel measuring up to 61·75μ. They are situated at the basal region of the silica cells (fig. 34, 18; pl. LXVIII, 6).

The grooves are comparatively narrow and characterized by the presence of usually one row of stomata. The epidermal cells here are not distinguishable. The stomatal grooves are so narrow that the rows of spicules almost overlap and appear as mesh-work of spines (fig. 34, 18; pl. LXVIII, 6 and 10). This forms a very striking pattern along with the silico-suberous couple of the ridge-epidermis.

(ii) UPPER.—The fragments of upper epidermis, though incomplete in some respects, show several important characters of diagnostic value. The general appearance of epidermal fragments is somewhat simpler than the lower one described above. The fundamental cells are uniformly arranged and not more than seven rows were observed (fig. 35, 21; pl. LXVII, 7). They are more long than broad. Their walls are undulated and slightly thickened (pl. LXVIII, 1). The length varies from 19·5μ to 91μ and the width from 16·25μ to 19·5μ. The short cell-pairs are interposed between the long epidermal cells, fairly numerous and uniformly distributed. One or two short cell-couples alternate with an epidermal cell. *Silica cells* vary from biscuit to somewhat dumb-bell shape; thus the neck may be either absent or inconspicuous. They are 19·5μ long and up to 13·0μ broad. *Cork cells* are not prominent, rather pressed and 7·8μ long and 14·3μ broad (pl. LXVIII, 6). Stomata are prominent, ovoid in shape and arranged in one or two rows (fig. 35, 21). In size they vary from 29·25μ to 32·5μ and 19·5μ. *Spicules* are small and scanty. Neither bulliform cells nor the region over the veins could be seen.

B. *Epidermal surface of leaf-sheath*

There is a great similarity between the gross anatomy of the leaf and the leaf-sheath. The grooves of the leaf-sheath are wide, consisting of as many as fourteen longitudinal rows of fundamental

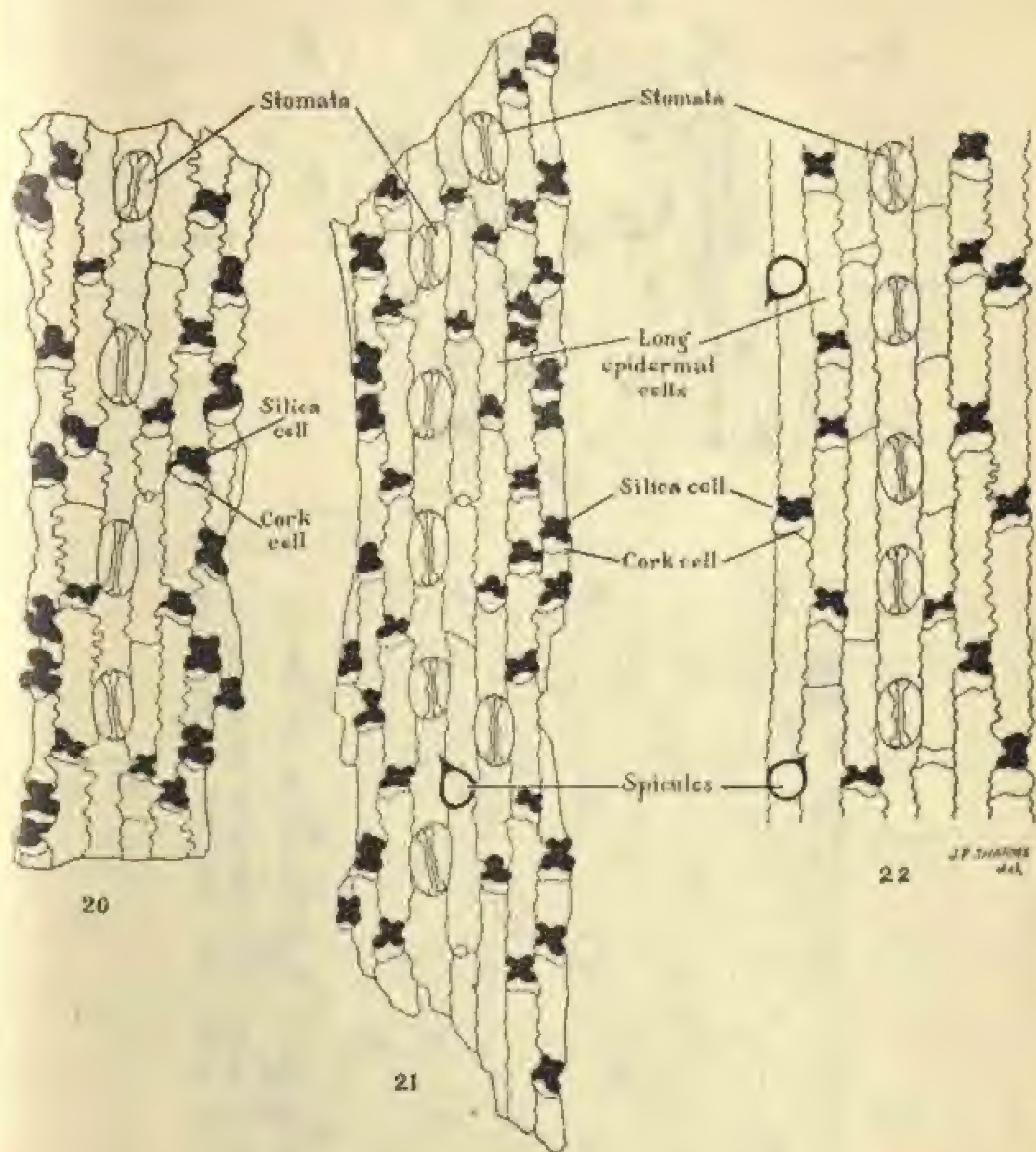


FIG. 35. *20 and 21, HST 1-1580, diagrammatic sketches: upper epidermis (in part) showing arrangement of stomata, shape and size of silica and cork cells; 22, diagrammatic sketch of upper epidermis (in part) of* Saccharum spontaneum *for comparison with 20 and 21.* (×360)

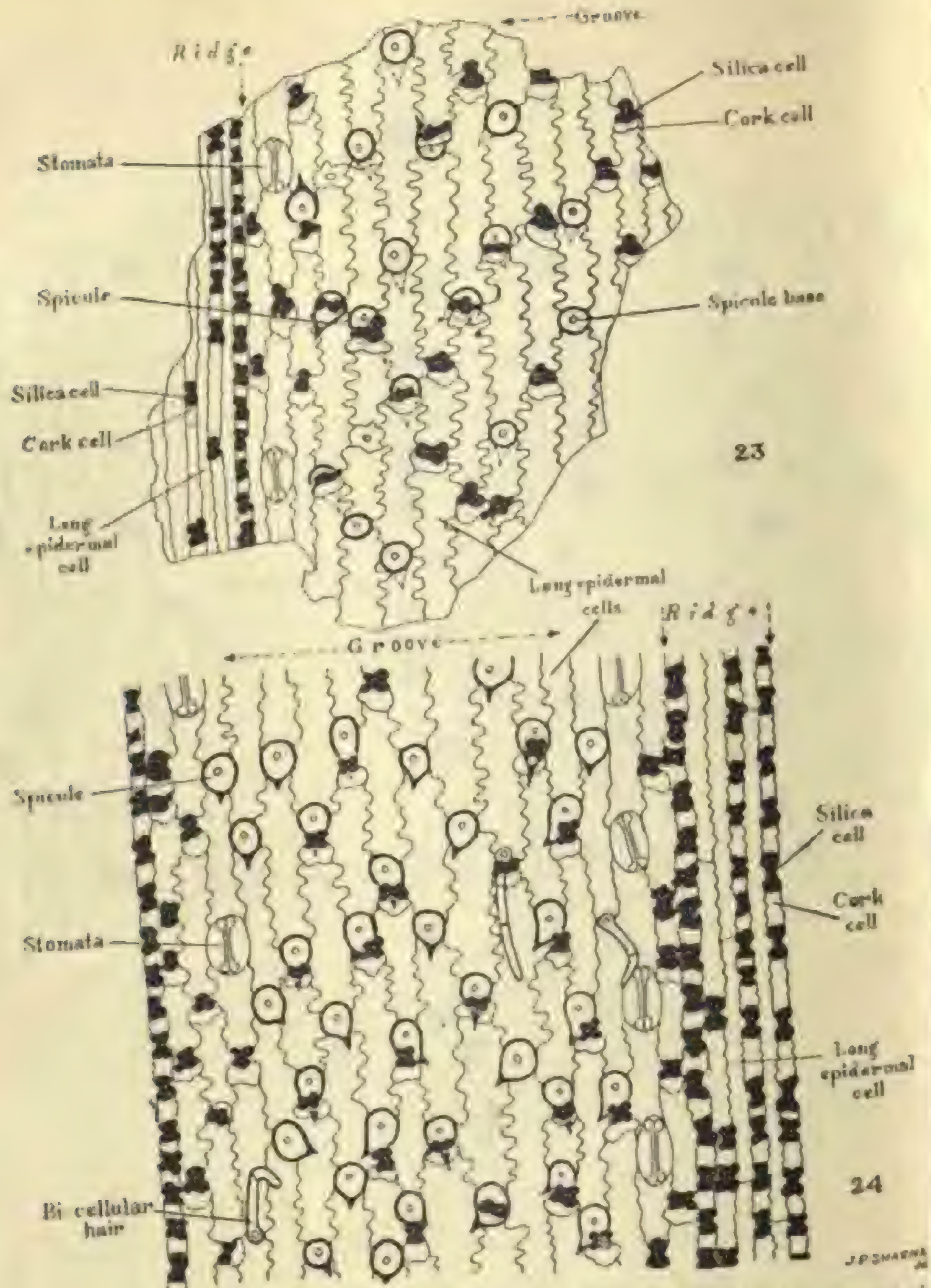


FIG. 96. 23, *HST 1-1580, diagrammatic sketch of leaf-sketch epidermis showing anatomical of different cells on the ridge and groove; 24, diagrammatic sketch of leaf-sheath epidermis of* Sacc... spontaneum *for comparison with 23.* (×360)

TABLE 2

STRUCTURES OF LEAF AND LEAF-SHEATH OF SOME GRASSES IN COMPARISON WITH THE PLANT-REMAINS FROM MUD-PLASTER RECOVERED FROM HASTINAPURA

Material	Leaf epidermis								Leaf sheath epidermis			
	Lower					*Upper*					*Ridge*	
	Stomata on the grooves	Spicules on the ridge	Spicule arrangement within a row	Cork-silica [illegible] between spi[illegible]	Shape of silica cells on the ridge	Stomata on the grooves	Spicules in groove	Distribution of cork-silica cells in unit area and their proportion	*Stomata*	*Cork-silica-spicule combination in groove*	Type of cells	Proportion of different types
Plant from Hastinâpura (mud-plaster)	In mostly 1, rarely two rows.	One row of spicules or denticules on either side	Very close	Mostly cork [illegible] 1-3. Silica [illegible] rarely 1	Halter or dumb-bell	1-2 rows	In rows	Numerous, almost equal	Single row on the periphery of the groove	Numerous	Long cells and short cell pairs	Almost equal
Arundo donax	In 3-4 rows	All rows of short cells bear spicules, 2-5	Widely spaced	1-7 or more in [illegible]	Dumb-bell	Scattered	In rows	Scanty	Single row on the periphery of the groove	Absent	Long cells and short cell pairs. Some rows of entirely long cells	Two types show great variation; more short cell pairs between long cells
	In 2-6 or more rows	All rows of short cells bear spicules, 2-5	Wide to very widely spaced	1-12 or more i[illegible] pairs	Dumb-bell	Scattered	Not observed	Scanty	Scattered	Absent	Long cells and short cell pairs. Some rows of entirely long cells	Two types show great variation; more short cell pairs between long cells
	In 2-4 rows	Only one row bears spicule	Widely spaced	1-6 or more cork cells. Silica cells 1-2	Dumb-bell	1-2 rows	Scanty, somewhat in rows	Scanty, mostly cork cells	Single row on the periphery	Scanty	Long cells and short cell pairs; also solitary cork cells	Almost equal
...iana	In 2-4 rows	Usually absent, may be present locally	Widely spaced	1-20 or more cork cells. Silica cells 1-4	Round to oval	1-2 or more rows	Diffuse, rather numerous	Scanty, mostly cork cells	Scattered	Absent	Long cells and short cell pairs	Two types show great variation
...a ...caudata)	In 1-2 rows	Only one row bears spicules	Widely to very widely spaced	1-24 or more [illegible]	Dumb-bell	1-2 rows	In rows	Scanty, mostly cork cells	Single row on the periphery	Occasionally present	Long and short cell pairs	Almost equal
	In 1-2 or 3 rows, occasionally more	Usually one row of spicules on either side	Very close to sometimes widely spaced	Usually 1-3 cork cells. Silica cells occasionally [illegible]	Halter to biscuit	1-2 rows	In rows	Numerous to few, proportion varies	Single row on the periphery	Numerous to few	Long and short cell pairs	Almost equal

...CCHARUM IN COMPARISON WITH THE MATERIAL FROM HASTINĀPURA

Upper		Leaf-sheath epidermis		
			Ridge	
... in grooves	Distribution of cork-silica cells in unit area and their proportion	*Cork-silica-spicule combination in grooves*	Type of cells	Proportion of diffe-rent types
	Numerous, almost equal	Numerous	Long cells and short cell pairs	Almost equal
	Scanty, mostly cork cells	Absent	Long and short cell pairs; Some rows entirely of long cells	Two types show great variation
	Often numerous	Not numerous	Long and short cell pairs	T...
	Scanty, mostly cork cells	...	...	
	Often numerous, solitary cork cells and short cell pairs equally present	Scanty	Long and short cell pairs	Alm...
	Numerous, almost equal	Numerous	Long and short cell pairs	Almos...

cells (fig. 36, 23; pl. LXVIII, 2). Epidermal cells are 39μ-104μ long and 20μ to 26μ broad. The walls are fairly thick and rugged. Both silica and cork cells along with the spicules are interspersed between the long epidermal cells. Their distribution appears to be characteristic. The pointed ends of spicules are often broken, but the basal remains indicate their position. The *silica cells* vary in shape and are not always shaped like halter or dumb-bell. The short cell pairs towards the extremities of the groove do not show spicules and are more like the cells on the ridges (fig. 36, 23). The silica cells are 9·75μ to 18·2μ long and 9·75μ to 13·0μ broad. The *cork cells* are somewhat crescent-shaped, 6·5μ to 19·5μ long and 9·75μ to 19·5μ broad. The spicules are 26μ long and 16·25μ broad and appear to be fairly numerous. A sort of triad is often present as a combined unit of silica cell, cork cell and spicule. The *stomata* are localized towards the extremity of the ridge forming one single row (fig 36, 23; pl. LXVIII, 2). They are ovoid and have four guard cells showing affinity to *Graminae*. They appear to be scanty in the grooves and their size is about 27μ × 13μ.

The ridge is distinct and is mostly composed of short cell-pairs, particularly the row adjoining the groove. In other rows, short cells gradually diminish in number proportionately to the increase of long epidermal cells. The *silica cells* are somewhat shaped like dumb-bells with inconspicuous neck. They are slightly smaller in size and are 9·75μ to 13μ long and about 6·5μ broad. The *cork cells* may be distinct to indistinct and are 6·5μ to 13μ long and about 9·75μ broad (fig. 36, 23; pl. LXVIII, 2).

C. *Cross-section of leaf sheath* (?)

The deteriorated nature of the material makes it difficult to say whether the structure examined by us is the normal structure or it has disorganized (pl. LXVII, 5). Several sections examined show a mass of thin-walled cells somewhat similar in shape and size. No vascular bundle is visible anywhere (pl. LXVIII, 8). This makes it impossible to classify and identify it. But the gross structure gives one the impression that it may be a portion of the ground tissue of a leaf-sheath.

D. *Husks of cereal*

Fragments of husk or chaff of cereals were noticed embedded in the mud-plaster. Under a hand-lens these appeared yellowish in colour, and the surface view indicated typical chess-board pattern of the rice-husk. Under the microscope, their rough surface appeared to be due to distinct ridges and grooves. The thick epidermal cells with characteristic zigzag wall running in parallel rows were also found. Here stout dagger-shaped hairs were present in a regular fashion (pl. LXVII, 6). All these characteristics[1] indicate that these are nothing but husk of rice.

IDENTIFICATION OF A, B AND C.—Wider appears to be the first worker to use epidermal patterns in grasses for their classification and identification.[2] Brandis made some intensive study of bamboo-leaf and was able to use leaf epidermal structure for the classification of genera and in some cases species.[3] Artschwager's work on *Saccharum* shows that by well-developed techniques it is possible to detect the epidermal patterns and finally construct a taxonomic key.[4] Narasimhan and others have also made use of the stem

[1] A. L. Winton, *The Microscopy of Vegetable Foods* (New York, 1916).

[2] A. Wider, *Beiträge zur Anatomie des Staties von Saccharum Bebi Wiss B. of B.* (1898) (original not seen).

[3] D. Brandis, 'Remarks on the structure of bamboo leaves', *Transactions of Linnean Society*, series 2, Botany, 7 (London, 1907), pp. 69-72.

[4] E. Artschwager, 'A comparative study of the stem epidermis of certain sugarcane varieties', *Journal of Agricultural Research*, 41 (1930), pp. 853-65; *ibid.*, 60 (1940), pp. 503-49; also Artschwager in U.S. Dept. Agric., Technical Bulletin no. 811 (1942).

epidermis of cultivated varieties of sugar-cane for identification.[1] At a higher level of classification, Prat has indicated the usefulness of the patterns formed by the epidermis in determining the different genera of this group of plants.[2] His remarks are very interesting, for he says, 'The first step in analysing the epidermis of a grass will be thus to determine *what shapes of cells are present.* In general, this is sufficient to reveal the Sub-family, the tribe, sometimes the genus, and we can obtain this information on a tiny fragment of leaf . . .'

Taking the size of the holes in the mud-plaster of the Hastināpura material as the criterion for the size of the mature grasses and using the classification of Indian Graminae by Gamble,[3] six genera were selected for comparison. Of these, for the genus *Saccharum,* five species and several varieties were available. For the rest of the genera only one representative was studied, viz. *Arundo donax, Phragmites karka, Erianthus ravennae, Neyraudia reynaudiana* and *Themeda caudata* (*Anthistiria caudata*). A comparative study of the anatomical features of the leaf and the leaf-sheath epidermis shows that the most useful characters for separating the genera are:—

Lower epidermis: (1) distribution of stomata on the grooves; (2) arrangement of spicules or denticules within a row; and (3) cork-silica cells between the spicules.

Upper epidermis; distribution of cork silica cells in unit area and their proportion.

Leaf-sheath epidermis: cork-silica-spicule combination.

Using the same criteria for the classification of the material from Hastināpura, it will be seen that it shows the greatest similarity with the genus *Saccharum* (table 2). Now, for its further classification, five species of *Saccharum* have been studied in detail (table 3). There is no doubt that though a great deal of anatomical similarity between the different species is present, by using the characteristic shape, size and frequency of different characters, it is possible to match the Hastināpura material with *Saccharum spontaneum.* Amongst the different varieties of *Saccharum spontaneum,* the material under investigation shows the greatest similarity with the wild varieties.

(c) Material from HST 1-1263: charcoal (pl. LXIX, 1-7)

Gross feature.—The charcoal pieces vary in size from $2\frac{1}{2} \times 1\frac{1}{4}$ in. to small fragments (pl. LXIX, 1). Neither pith nor bark has been observed. They are very fragile and appear to be fairly even- and fine-textured. Splitting is easy and longitudinal surfaces show fairly straight grain. The gross features give the impression of a *diffuse-porous wood.*

Microscopic structure.—*Growth rings* are faintly visible, irregularly spaced, delimited by a narrow zone of flattened fibres. *Vessels* are just visible under a lens, distinct under the microscope, very small, oval, sometimes angular, mostly in radial multiple of 2-4 or 5 and arranged in distinct radial chains (pl. LXIX, 2 and 5), occasionally single. Vessels vary from 22μ to 75μ in diameter; tyloses absent; perforation plate simple, intervessel pits small, oval, crowded with lenticular aperture. *Parenchyma* cells are both paratracheal and apotracheal; paratracheal parenchyma scanty, often partially encircling the vessel; apotracheal parenchyma mostly diffuse and often containing deposits;

[1] V. R. Narasimhan and J. T. Rao, 'Comparative study of the stem epidermis of Coimbatore canes in cultivation', *Proceedings of the First Biennial Conference of Sugarcane Research Workers in the Indian Union,* pt. II-2, Botany (January, 1951).

[2] H. Prat, 'General features of the epidermis in Zea Mays', *Annals of the Missouri Botanical Garden,* 35 (1948), pp. 341-51.

[3] J. S. Gamble, *A Manual of Indian Timbers* (London, 1922).

crystals sometimes present; initial or terminal parenchyma seldom distinct. *Fibres* semi-libriform, squarish to angular, arranged somewhat in radial rows, non-septate. *Rays* are distinct under microscope, fine to medium broad, closely spaced, 1-3 or 4 seriate, heterogeneous: (a) uniseriate rays mostly composed of upright cells, fairly numerous; (b) multiseriate rays long, widest portion composed of procumbent cells, and tapering ends with upright uniseriate cells, many rays occasionally joining up.

Identification.—The even and fine-textured nature of the charcoal and its characteristic anatomical features such as small pores, radial arrangement of vessels, diffuse parenchyma and characteristic rays indicate its affinity to the woods of the family *Apocynaceae*,[1] especially *Holarrhena* and *Wrightia*. A closer examination of all the species of these two genera shows that the anatomical structure of the charcoal resembles best *Holarrhena*, and it has, therefore, been identified as *Holarrhena antidysenterica*.

(v) *Discussion*

Archaeological significance.—Rice is a staple food in India. Its past history, based on direct evidence, takes us back only to two thousand years.[2] The present discovery at Hastināpura now takes the history of rice back by another thousand years. The use of rice three thousand years ago is probably the oldest record in the world. Archaeologists attach considerable importance to the remains of cereal they collect because these provide evidence on the food-habits of the people of the past. In India information on this point is scanty. The use of wheat and barley has been recorded only from the Indus valley civilization.[3] However, considerable work has been done in Europe and America to build up the past history of the cereals and thereby the food-habit of the people of different civilizations. The antiquity of some of well-known cereals[4] of the world is given in table 4, showing how far back they have been traced so far.

Ancient literature mentions three important cereals, *vrīhi* (paddy), *godhūma* (wheat) and *yava* (barley). In Vedic literature rice has been mentioned as *dhānya*, *vrīhi* or *śāli*. The *Rigveda-saṁhitā* contains reference to *dhānya*, which is probably a term used for all the cereals. It is the *Atharvaveda-saṁhitā* which for the first time mentions *vrīhi* definitely for rice.[5] The age of the *Atharvaveda* and that of the rice from Hastināpura is about the

---

[1] R. S. Pearson and H. P. Brown, *The Commercial Timbers of India*, II (Calcutta, 1932).

[2] B. Sahni, Presidential Address to the Botany section. *Proceedings 25th Indian Science Congress*, Calcutta (1938), p. 166; also B. Sahni, *Memoirs of the Numismatic Society of India*, no. 1 (1945); F. E. Zeuner, 'Palaeobotanical aspect of Geochronology', *Palaeobotanist*, I (1952), p. 454.

[3] *An. Rep. Arch. Surv. Ind.*, 1926-27 (Calcutta, 1930), p. 54; J. Marshall, *Mohenjo-daro and the Indus Civilization*, I (London, 1931), p. 27; M. S. Vats, *Excavations at Harappā* (Delhi, 1940), I, p. 79.

[4] W. F. Libby, 'Radio-carbon dating', *Endeavour*, 13 (January, 1954); R. J. Braidwood, 'From cave to village', *Scientific American*, 187 (October, 1952); J. Percival, 'Cereals of ancient Egypt and Mesopotamia', *Nature*, 138 (1936), pp. 270-73; H. Helbaek in *Acta Archaeologica*, 23 (1952); also in *Proceedings of Prehistoric Society*, pt. 2 (1952), paper no. 12; *Ninth Annual Report, Institute of Archaeology*, University of London (1953); P. C. Mangelsdorf and C. E. Smith, 'New archaeological evidence on evolution in maize', *Botanical Museum Leaflets*, Harvard University, 13, no. 8 (1949); L. F. Randolph, 'New evidence on the origin of maize', *The American Naturalist*, 86, no. 829 (July-August, 1952); H. C. Cutler, 'The oldest corn in the world', *Chicago Natural History Museum Bulletin*, 22, no. 2 (February, 1951).

[5] D. Chatterjee, 'Note on the origin and distribution of wild and cultivated rices', *Indian Journal of Genetics and Plant Breeding*, II, no. 1 (1951), p. 20; also G. P. Mazumdar, *Some Aspects of Indian Civilization* (Calcutta, 1938), pp. 32-33.

same. The discovery of rice at Hastināpura and the specific mention of rice in the *Atharvaveda-saṁhitā* may not be without any significance.

TABLE 4

LIST OF CEREALS WITH THEIR AGE

Country	Name of cereal	Age	Remarks
Egypt (Fayum A) ...	Wheat and barley (uncarbonized)	4095 ± 250 B.C.	Radio-carbon dating
Egypt (Fayum A) ...	Wheat and barley	4391 ± 180 B.C.	Do.
Iraq (Jarmo)	Wheat and barley (carbonized)	About 4750 B.C. (?)	Do. (based on associated finds)
Denmark (Birknaes, Ostbirk)	Wheat and barley	Bronze age (middle of the first millennium B.C.)	Archaeological age
Denmark (Samlegaard) ...	Wheat and barley	Early Bronze Age	Do.
England (Itford Hill) ...	Wheat	Late Bronze Age	Do.
England (Maiden castle and other sites)	Wheat	Early Iron Age	Do.
North America (Tularose Cave)	Maize	About 2500 B.C. (?)	Radio-carbon dating (based on associated materials)
New Mexico (Bat Cave) ...	Maize	About 1000-1500 B.C.	Radio-carbon dating
India (Mohenjo-daro and Harappā)	Wheat and barley	About 2000 B.C.	Archaeological age
India (Khokrā Kot) ...	Wheat or barley or paddy (?)	About 100 B.C.	Do.
India (Hastināpura) ...	Rice (carbonized)	About 1000 B.C.	Do.

According to Ramiah and his co-workers, rice is 'the oldest cereal under cultivation in India'.[1] On the other hand, the excavation of the Indus valley sites has not yielded any rice. This may mean that rice was not known to the people of north-west India at the height of Indus valley civilization. The question that now arises is: when was rice introduced in north India? The remains of Hastināpura show that the people of the

[1] K. Ramiah and others, 'Improvement of rice in India', *Empire Journal of Experimental Agriculture*, 20, no. 79 (1952), p. 162.

upper Gangetic valley were well acquainted with rice and its uses about three thousand years ago. Here it may be pointed out that use of rice-husk as a binder for mud-walls indicates the knowledge of a natural produce which comes to people when they have used it for a considerable period. It may not, therefore, be mere speculation to draw the conclusion that the people of the upper Gangetic valley had been using rice long before what the age of Hastināpura indicates.

The plant-remains from the mud-plaster have yielded *Saccharum spontaneum*, a variety of wild cane. This was used in both vertical and horizontal fashions to give strength to the wall which was further inforced by plaster of mud mixed with rice-husk. This method of building houses is still practised by the poor in north India. Tall thick grasses of *Arundo*, *Anthistiria*, *Andropogon* and *Saccharum* are used both for thatching the roof and making the wall. It will, therefore, be seen that the art of building houses by the poor people has remained exactly the same as was practised three thousand years ago.

There were two different lots of charcoal. One was *Dalbergia sissoo* (sissoo) and the other *Holarrhena antidysenterica* (kurchi). From the present state of these plant-remains it is not possible to say whether they were kept by the inhabitants as charcoal or fire-wood which turned into charcoal in course of time. Nor can we say for what specific purpose they were used. But the present use of these timbers is many. For example, *sissoo*, which is an important commercial timber, is used for furniture, carving and rough work like cart-wheel making.[1] The present use of kurchi is mainly for carving and toy-making. This tree is well-known for the special property of its bark which is used as a tonic and febrifuge and in dysentery.[2] Beads made of this wood are worn round the neck as a medicinal charm.[3]

BOTANICAL SIGNIFICANCE.—The plant-remains from Hastināpura can be botanically classified into two groups. Rice (*Oryza* sp.) and wild cane (*Saccharum spontaneum*) belong to the monocotyledons. The charcoals are from the woods of dicotyledons (*Dalbergia sissoo* and *Holarrhena antidysenterica*). The present distribution of these plants is given below.

The investigation on the remains of rice shows certain morphological and anatomical characters which we have not been able to match so far with either cultivated or wild varieties. The study is still being continued. When that is completed, the botanical aspect of this rice will be dealt with.

The wild cane (*Saccharum spontaneum*) is widely distributed. It is found in the sub-Himalayan region to south-east Asian countries, viz. Java, Sumatra and Malayasia. Mukherjee, who has made an extensive survey of *S. spontaneum* and allied grasses, has found high concentrations of wild *Saccharum* in the slopes of the Himalayas.[4] Further, he could distinguish at least one hundred and twentyfive types which alone belonged to *S. spontaneum*. It is, therefore, not difficult to visualize that tall grasses were available then in the nearby forest and their easy accessibility made them a convenient raw material for house-building. Even now, near about Hastināpura *S. spontaneum*, *S. munja* and other similar grasses are abundantly found.[5]

[1] H. Trotter, *The Common Commercial Timbers of India and Their Uses* (Dehra Dun, 1944).

[2] K. R. Kirtikar and B. D. Basu, *Indian Medicinal Plants*, pt. II (Allahabad, 1918).

[3] B. L. Gupta, *Forest Flora of Chakrata, Dehra Dun and Saharanpur Forest Divisions, United Provinces*, 3rd. ed. (Calcutta, 1928), p. 316.

[4] S. K. Mukherjee, 'Variability in *Saccharum spontaneum* L and its use in sugarcane breeding', *Proc. First Biennial Conf. Sugarcane Research Workers*, Coimbatore (January, 1951).

[5] R. L. Srivastava, 'Afforestation in the "Kholas" of Hastināpura (Meerut)', *Indian Forester*, 79 (1953), pp. 344-50.

Sissoo (*Dalbergia sissoo*) is an important tree of deciduous forest where it often predominates and makes its way along with *Saccharum munja* in the western sub-Himalayan tract. *S. spontaneum* is another characteristic grass which is also associated in the early stage of its development. According to Champion's classification of forest-types, sissoo has been grouped under 'khair-sissu forest'. It grows along the larger rivers of north India (Panjab, Uttar Pradesh, Bihar, Bengal and Assam) mixed with khair (*Acacia catechu*).[1] It is indigenous and grows along the banks of rivers and in river-beds of Saharanpur District, and is occasionally killed where the rivers change their course in the sub-Himalayan tract. All that can be said here is that sissoo must have been an important timber tree of that time and found its way to household uses as at present.

Kurchi (*Holarrhena antidysenterica*) is a small tree of dry deciduous scrub forest and is often common in some parts of Panjab, Uttar Pardesh and Bihar. In the Himalayas it ascends up to 4,000 ft. In Saharanpur and Dehra Dun forests it is very common and often persists on grassy areas in abundance. Economically it is an important tree, as all parts of the plant have their uses, particularly the bark which is used in medicine for dysentery. This forms a component species of dry deciduous forest-types along with *Dalbergia sissoo* and grasses like *Saccharum spontaneum* and others.[2]

The light thrown by the plant-remains from Hastinâpura can now be summarized here. Out of the four main remains, one is rice, which must have been in cultivation near about Hastinâpura. Moreover, the use of husks as by-products of rice in plastering walls of houses reminds one of the practice prevalent now at places where rice is commonly grown. Of the other three remains the wild cane and the wood of sissoo and kurchi were either locally available or brought from nearby forests. They do not allow us to visualize any change in the vegetation of the neighbouring areas of Hastinâpura. Similarly, there does not appear to be any pronounced change in the climate of the area.

(vi) *Summary*

1. Some plant-remains obtained from the excavation at Hastinâpura (1950-52) have been studied and the results are reported here. They have yielded one cereal, one grass and two important commercial timbers. All the materials have been turned into charcoal except the grass.

2. The cereal and the wood-charcoal from Period II (*circa* ninth century B.C.) have been identified as rice (*Oryza* sp.) and sissoo (*Dalbergia sissoo*).

3. The plant-remains from the mud-plaster also from Period II (*circa* 800 B.C.) are wild cane (*Saccharum spontaneum*) and husks of rice (*Oryza* sp.).

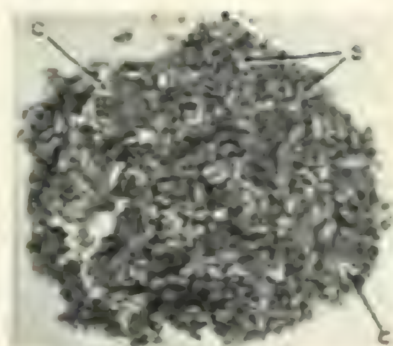
4. The charcoal from the Period III (second half of the fifth century B.C.) is kurchi (*Holarrhena antidysenterica*).

5. The archaeological and botanical significance has been discussed in the paper. The discovery of rice at Hastinâpura appears to be the oldest direct evidence to show its use three thousand years ago. The practice of using wild cane for house-walls and plastering them with mud is seen to be equally old. The use of rice-husk as a binder for mud-plaster may not be an accident. It indicates the knowledge of rice and its by-products to be much earlier than what the archaeological age of Hastinâpura would show.

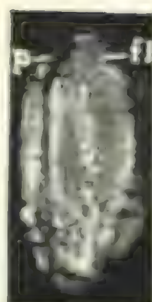
---

[1] H. G. Champion, 'A preliminary survey of the forest types of India and Burma', *Indian Forest Records* (New Series), I (Silviculture), no. 1 (July, 1936); also R. S. Troup, *The Silviculture of Indian Trees*, I (Oxford, 1921), pp. 294-318.

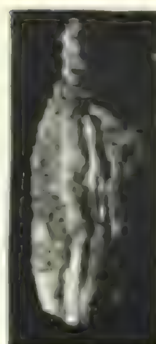
[2] R. S. Troup, *op. cit.*, II, p. 664.



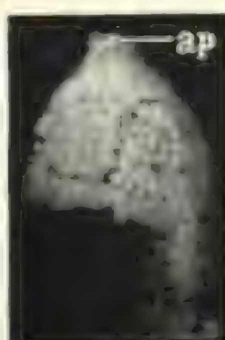




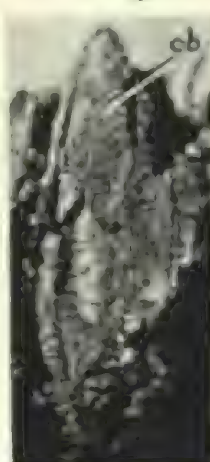




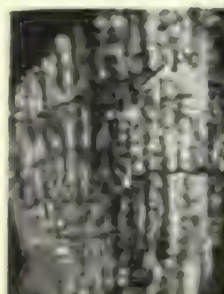














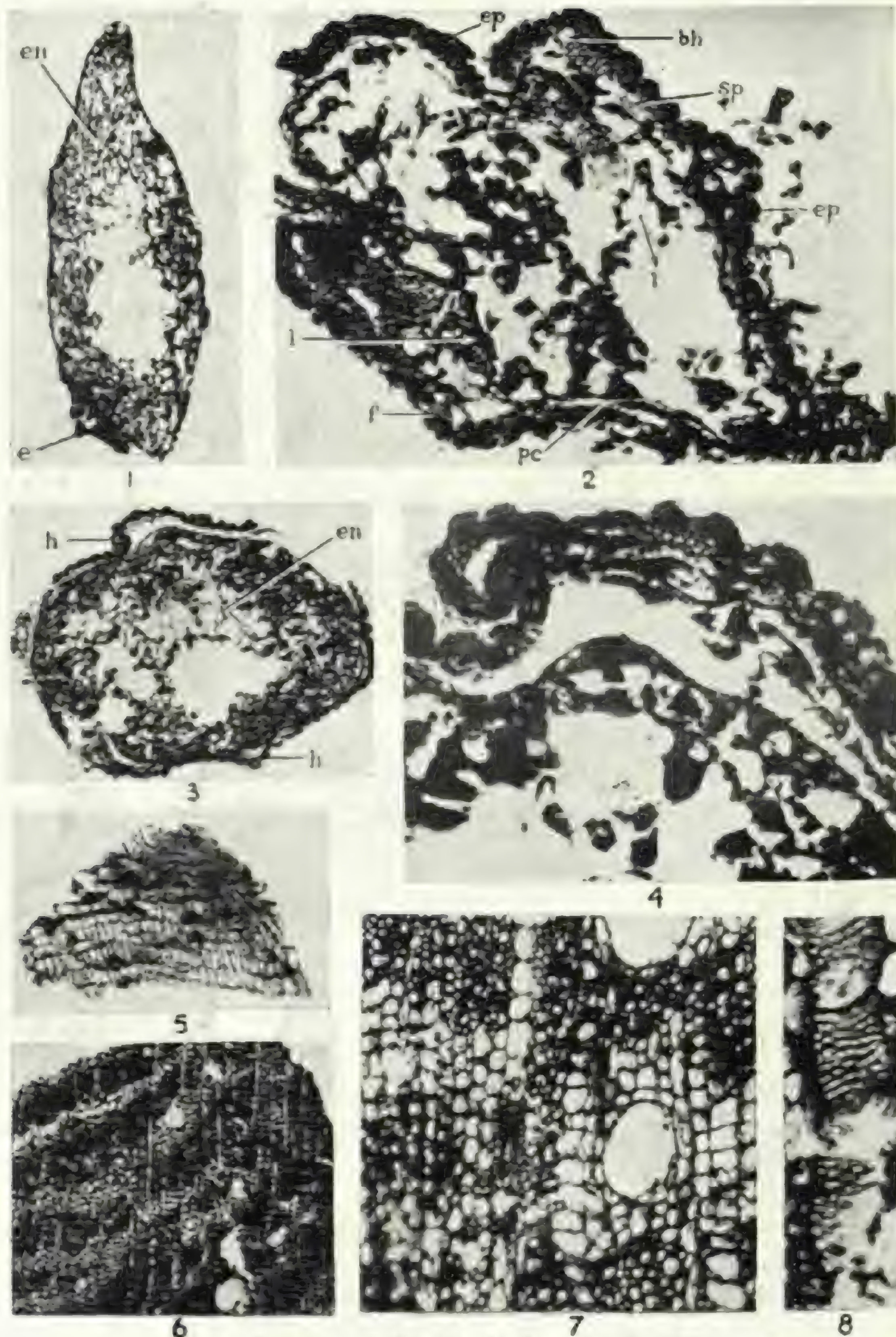








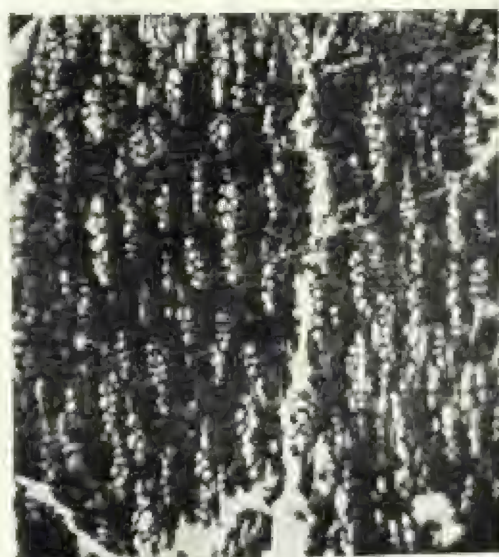
Oryza sp. (see page 135)



1-4, Oryza sp.; 5-8, Dalbergia sissoo (*see page 136*)


1

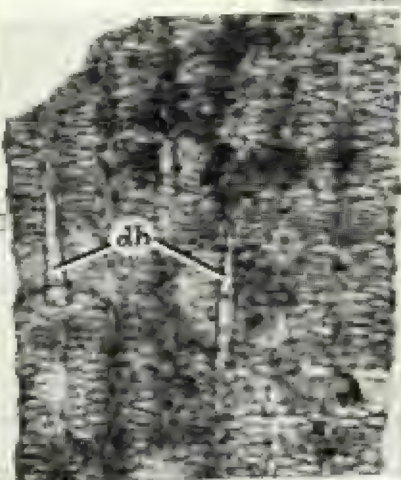

2


3



4


5

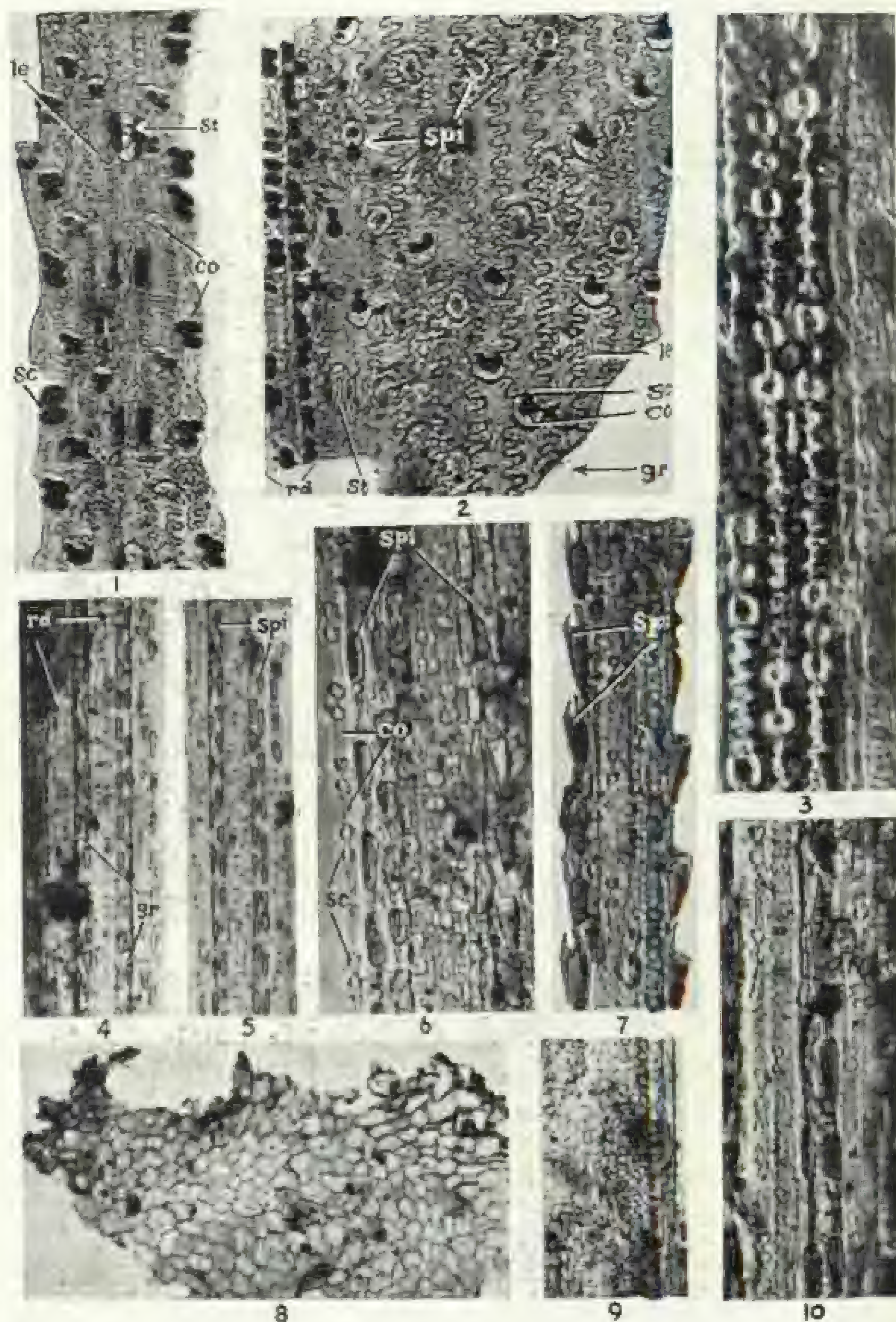


6


7


8

1-3, Dalbergia sissoo; 4, 5, 7 and 8, Saccharum spontaneum; 6, Oryza sp. (*see page 136*)



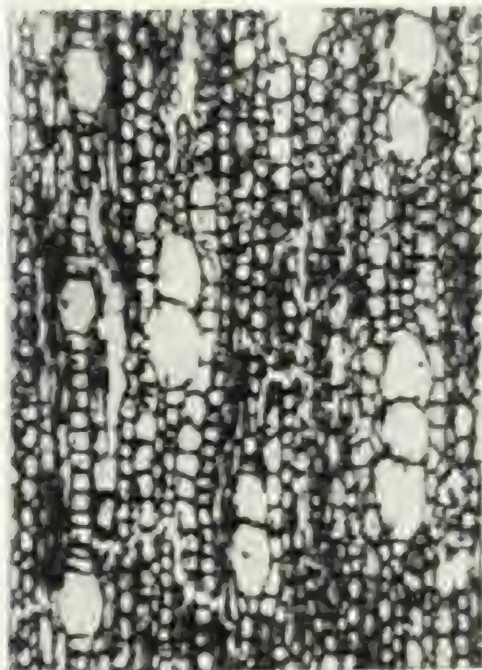
Saccharum spontaneum (*see page 136*)



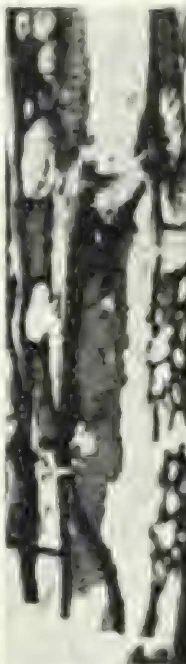
1



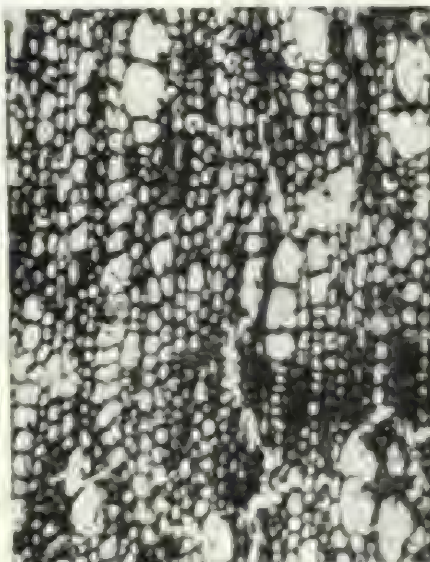
2



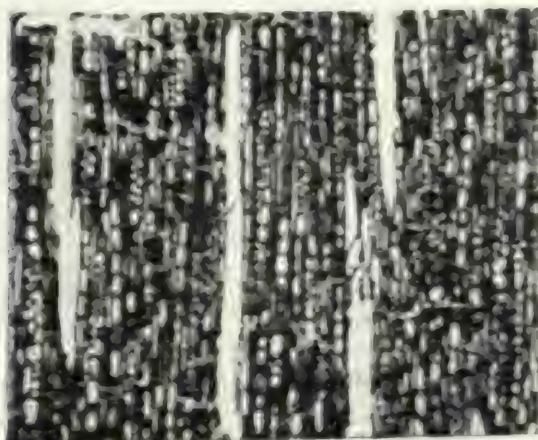
3



4



5



6



7

Holarrhena antidysenterica (see page 137)

6. All the four plants are found round about Hastināpura. This means that there has been no pronounced climatic change in the region during the last three thousand years.

(vii) *Acknowledgements*

Our grateful thanks once again are due to the Director General of Archaeology in India for giving us an opportunity to study these materials. We are especially grateful to Mr. B. B. Lal, the excavator, for sending us useful information on the excavations. Amongst others, our thanks are due to Dr. N. Parthasarathy and Mr. R. L. M. Ghose, Central Rice Research Institute, Cuttack; Dr. H. C. Mirchandani, Paddy Research Station, Nagina; Mr. N. L. Dutt, Sugarcane Breeding Institute, Coimbatore; and Mr. P. S. Mathur, Sugarcane Research Station, Shahjahanpur. Acknowledgements are also due to our colleagues at the Institute, specially Messrs. M. B. Raizada, K. N. Tandon, R. Shahi and B. S. Negi.

EXPLANATION OF PLATES

Pl. LXV

Oryza sp. (HST 1-1573)

1. Charred rice-spikelets (s) and charcoal chips (c). (Natural size.)
2. Broken spikelet with awn (a). Note the lower portion of the grain is exposed due to the breaking off of the husk. (×8.)
3. Another spikelet showing fertile lemma (fl) and palea (p). (×8.)
4. Collapsed spikelet showing sterile lemma (sl) and expansion of rachilla (r). (×8.)
5. Another flattened spikelet with awn. (×8.)
6. Grain embedded in tar-like substance. (×15.)
7. Part of spikelet showing tri-dentate nature of apiculus (ap). (×20.)
8. Two spikelets, one with awn (a). Note their shape and size. (×8.)
9. Outer surface of the paddy with chess-board pattern (ch.). (×20.)
10. Portion of the spikelet showing thickening of the rachilla (r). (×30.)
11. Inside view of the husk with pericarp (pc) attached. (×32.)
12. Surface view of the husks. (×18.)
13. Grains. Note their shape and size. (×3·5.)
14. Enlarged view of grains. (×8.)
15. Basal part of the grain showing embryonic region (e). (×30.)

Pl. LXVI

Oryza sp. (HST 1-1573)

1. Longitudinal section of a grain. Note the central portion hollow, endosperm (en) restricted to the sides, and embryonic region (e) on the bottom left. (×30.)
2. Transverse section of a spikelet showing thick wavy epidermis (ep), bases of hair (bh), sclerenchyma fibres (f), spongy parenchyma (sp), pericarp (pc) and lodicules (l). Phase contrast. (×150.)
3. Transverse section through the middle of a spikelet. Note how the husk (h) is attached on the grain. Cells of endosperm (en), though collapsed, fill up almost the entire grain. (×30.)
4. Portion of transverse section of a spikelet showing different structures from outside to inside. (×160.)

Dalbergia sissoo (HST 1-1573)

5. Photomicrograph of split-end of charcoal showing gross structure. (×10.)
6. Transverse section showing wavy parenchyma bands. (×40.)
7. Transverse section showing paratracheal distribution of parenchyma. (×110.)
8. Intervessel pits in tangential section. (×330.)

Pl. LXVII

Dalbergia sissoo (HST 1-1573)

1. Transverse section showing arrangement of vessels, parenchyma and fibres. Note scanty vessel in the field. (×40.)
2. Transverse section showing distribution of different elements. Note shape of parenchyma cells and width of rays. (×110.)
3. Tangential section showing distribution of rays. Note inconspicuous ripple-marks. (×80.)

Saccharum spontaneum (HST 1-1580)

4. Mud-plaster including the hole left by plant-material (pm). (×$\frac{1}{2}$.)
5. Photomicrograph of a fragment of plant-remains from the plaster. Note state of deterioration of tissues. (×110.)

Oryza sp. (HST 1-1580)

6. Photomicrograph of the outer surface of rice-husk showing zigzag epidermal cells and dagger-shaped hairs (dh). (×110.)

Saccharum spontaneum (HST 1-1580)

7. Surface view of groove in the upper epidermis of leaf. Note distribution of different tissues. (×110.)
8. Surface view of leaf showing dark vascular strands and bulliform cells suppressed by other adhering tissues. (×300.)

Pl. LXVIII

Saccharum spontaneum (HST 1-1580)

1. Upper epidermis in surface view. Note undulating nature of long epidermal cells (le), characteristic silica cells (sc), inconspicuous cork cells (co) and stomata (st) in rows. (×300.)
2. Leaf-sheath epidermis showing the nature and distribution of cells on the ridge (rd) and the groove (gr). Note shape and size of long epidermal cells (le), silica cells (sc), cork cells (co), spicules (spi) and stomata (st). (×300.)
3. Portion of lower epidermis highly magnified. Note halter or silica cells of dumb-bell shape and long epidermal cells. Phase contrast. (×600.)

4-5. Fragments of lower epidermis. Note parallel disposition of ridges (rd) and grooves (gr) and characteristic arrangement of spicules (sp). (×110.)

6. Same under high magnification. Note shape and arrangement of silica cells (sc), cork cells (co) and spicules (spi). (×300.)
7. Another portion of lower epidermis showing claw-like spicules (spi) in rows. (×300.)
8. Transverse section of a portion of leaf-sheath. (×110.)
9. Portion of leaf showing remnants of hypodermal cells. (×110.)

10. Another portion of lower epidermis. Note dumb-bell-shaped silica cells and spicules in rows. (×300.)

Pl. LXIX

Holarrhena antidysenterica (HST 1-1263)

1. Charcoal. (Natural size.)
2. Transverse section showing general distribution of vessels and fine rays. (×30.)
3. Transverse section. Note vessels in radial multiples and radial chain. (×110.)
4. Tangential section showing intervessel pits. (×160.)
5. Another transverse section. Note a faint growth-mark in the lower middle portion of the photo. (×110.)

6-7. Tangential sections showing arrangement of rays. Note the ray-components of individual rays. (×80.)

K. Pollen-analysis

A few soil-samples from the excavations were sent to Professor Ove Arbo Hoeg, Director, Birbal Sahni Research Institute, Lucknow, with a view to ascertaining if they contained any pollen-grains and, if so, what light the pollens could throw on the flora and climate of the time. While the material is still under examination, Professor Hoeg has very kindly sent the following preliminary note.[1]

Material

Six soil-samples from Hastināpura were sent by the Archaeological Survey of India for their pollen-analysis. Out of them, the following four are clayey and have yielded pollen.

1. HST 1, boring 5A, depth 1-6 ft.
2. HST 1, boring 5A, depth 6-10 ft.
3. HST 1, XCIX-CI, layer 31, early level of Period II.
4. HST 1, XLIX-L, layer 47, from the accumulation following the erosion.

The other two samples,

1. HST 1, boring 5A, depth 10-15 ft.
2. HST 1, boring 5A, depth 66-68 ft.

are sandy and have proved to be barren.

Technique

Since all the samples had a high percentage of silica, it was found necessary to boil them in hydrofluoric acid. The following procedure (after Faegri and Iversen) was adopted:

1. Boiled the sample in KOH (10 per cent) for 45 minutes.
2. Washed with water. Centrifuged.
3. Dehydrated with glacial acetic acid. Centrifuged.
4. Boiled in HF for about 25 minutes.
5. Washed in water. Centrifuged.
6. Treated with a fresh mixture of 9 parts anhydric acetic acid and one part con. H_2So_4. Heated gently on a water-bath to boiling point. Centrifuged.
7. Washed with glacial acetic acid. Centrifuged.
8. Washed with water. Centrifuged.

[1] The work was carried out by Shri S. N. Dube under the supervision of Professor Hoeg.

9. Added a drop of glycerine.
10. Mounted in glycerine jelly on slides.

SAMPLES

1. HST1, boring 5A, depth 1-6 ft.

This sample has yielded about twelve different types of pollen. Amongst these can be identified a winged pollen, which is probably that of Pinus, although this is not common. The material is quite rich in pollen-contents. It has also got many pieces of wood, some of which show pits.

2. HST 1, boring 5A, depth 6-10 ft.

This sample has yielded about fourteen types of pollen, some of which are common to sample 1. It also has many pieces of woods, some of which clearly show pitting. Pollen-percentage is fairly high.

3. HST 1, XCIX-CI, layer 31, early level of Period II.

This sample has yielded about a dozen pollens, some of which are not very common. As compared with the above two samples, the pollen-yield is rather poor. It has also yielded many pieces of wood.

4. HST 1, XLIX-L, layer 47, from the accumulation following the erosion.

This sample has also yielded a number of pollen and wood. The pollen-percentage is fairly high and some of the woods show pitting.

5. HST 1, boring 5A, depth 10-15 ft.

This sample is barren and is devoid of any pollen or wood.

6. HST 1, boring 5A, depth 66-68 ft.

No pollen or wood is obtainable.

Apart from the Pinus pollen it has not so far been possible to identify the various pollen-grains, but work on the classification of Indian pollen is being carried out in this Institute.

3. OTHER EXPLORATIONS

A. SITES WITH THE PAINTED GREY WARE (fig. 1)

Once the significance of the Painted Grey Ware as an outstanding ceramic industry of the Dark Age became apparent, it was but natural to investigate as to which other sites in India contained this class of pottery. Accordingly, systematic explorations were carried out and the following is an up to date[1] distribution list of this ware:—

AHICHCHHATRĀ (28°22′ North Lat. and 79°7′ East Long.).—The ruins of Ahichchhatrā lie in Aonlā Tehsil of Bareli District in Uttar Pradesh. The Painted Grey Ware had been discovered here during the 1940-44 excavations and a short note on it was published in *Ancient India*, no. 1 (1946), pp. 58-59.

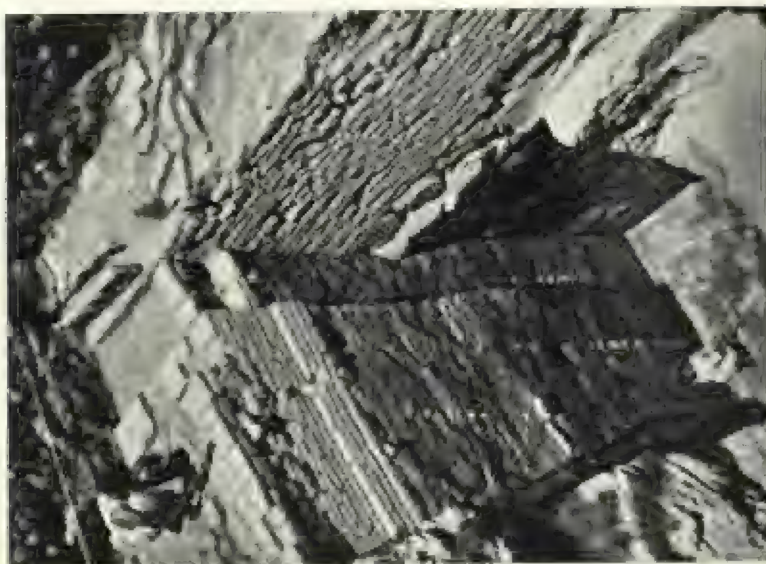
AMĪN (29°54′ North Lat. and 76°52′ East Long.).—Amīn is a small town in Thaneshwar Tehsil of Karnāl District in Panjab. The ancient mound, which is largely covered up with modern houses, is nearly 60 ft. in height and covers an area about ½ × ¼ mile. Sherds of Painted Grey Ware were recovered from the cleanings of a deep well in the midst of the village, which fact suggests that the strata bearing this class of pottery lie fairly low in the mound.

BAGHAULĀ (28°13′ North Lat. and 77°19′ East Long.).—It is a small village in Palwal Tehsil of Gurgaon District in Panjab. The ruins, which are not very extensive, lie close to the Delhi-Mathurā road, about 4 miles from Palwal.

BĀGHPAT (28°57′ North Lat. and 77°13′ East Long.).—A Tehsil headquarters in Meerut District, U.P., it lies on the eastern bank of the Yamunā. The river seems to be

[1] This list was prepared in 1953. Since then the Painted Grey Ware has been discovered at many more sites, amongst which mention may be made of Bairāṭ (below, p. 144) and Pariar, District Unao, U. P. Information about the latter from Dr. Y. D. Sharma.

PLATE LXX



B. *A trial-pit at Tilpat (see page 141)*



A. *A trial-pit at Chhat (see page 139)*

To face page 139



A. *The ancient mound at Rupar (see page 141)*



B. *The ancient mound at Pānipat (see pages 140 and 141)*

eating gradually into the ancient ruins which lie to the south of the modern town. Painted Grey Ware could, however, be picked up from this area, specially from the eroded sections close to the river.

BAHĀDURGARH (28°41′ North Lat. and 76°56′ East Long.).—It is a Tehsil headquarters in Rohtak District of Panjab. The occurrence of the Painted Grey Ware at this site was reported by Shri O. Prüfer.

BAIJNĀTHPUR.—It is located in Thakurdwārā Tehsīl of Morādābād District, U.P. A collection from this site lies in the Central Asian Antiquities Museum. Shri Krishna Deva has helped the author in identifying the place.

BARNĀWĀ (29°7′ North Lat. and 77°26′ East Long.).—It is a village in Sardhanā Tehsil of Meerut District, U.P. The ancient mound, fairly high and extensive, lies at the confluence of the Krishnī and Hindan rivers. There are quite a few exposed sections where the Painted Grey Ware can be picked up in abundance.

BISRAKH (28°34′ North Lat. and 77°26′ East Long.).—It is a small village about 4 miles to the west of Mārīpat railway station in Ghāziābād Tehsil of Meerut District, U.P. On the ancient remains stand several modern houses. There are, however, some unoccupied areas where the Painted Grey Ware occurs in profusion. The height and extent of the ancient habitation do not appear to have been much.

CHAK 86 (29°14′ North Lat. and 73°14′ East Long.).—It lies in Anūpgarh Tehsil of Gangānagar District of Bikaner, Rājasthān. During his explorations in the Ghaggar valley Shri A. Ghosh discovered about twenty sites containing the Painted Grey Ware, Chak 86 being one of them. Besides, he came across several Harappan sites in the valley (below, p. 146), and it was observed that the Painted Grey Ware settlements were later than the Harappan ones. Information from Shri A. Ghosh.

CHĀNDPUR. (31°1′ North Lat. and 76°38′ East Long.).—The place, located in Rupar Tehsil of Ambālā District, Panjab, was visited by Shri B. K. Thapar, who discovered the Painted Grey Ware here.

CHARAN (31°3′ North Lat. and 76°14′ East Long.).—It lies in Rahaon Tehsil of Jullundur District in Panjab. The occurrence of Painted Grey Ware was noted by Shri B. K. Thapar.

CHHAJJĀ (31°7′ North Lat. and 76°33′ East Long.).—It lies on the right bank of the Sutlej in Hoshiārpur District of Panjab. A collection, made by Munshi Sadar Din from this site and now lodged in the Central Asian Antiquities Museum, was examined by the author, and the Painted Grey Ware was found to occur. The site was later visited by Shri B. K. Thapar for a check-up.

CHHAT (30°37′ North Lat. and 76°47′ East Long.).—Located in Rājpur Tehsil of Patiālā District in PEPSU. The mound is fairly extensive and rises at places to a height of nearly 50 ft. above the surrounding ground-level. Trial-soundings, made at a couple of places, revealed that the Painted Grey Ware represented the earliest occupation at the site and that it was followed by the N.B.P. Ware occurring higher up in the mound (pl. LXX A).

DHANKOT (28°28′ North Lat. and 76°53′ East Long.).—Located in Gurgaon District of Panjab, the site was visited by Shri B. K. Thapar who noted the occurrence of the Painted Grey Ware.

DOTHERĪ (29°25′ North Lat. and 74°0′ East Long.).—Lying in Bikaner Division of Rājasthān, these mounds were explored by Sir Aurel Stein, whose collection is now lodged in the Central Asian Antiquities Museum. While going through this collection, the author found that it contained the Painted Grey Ware.

DUGRĪ (30°28′ North Lat. and 76°34′ East Long.).—It lies about 4 miles to the north-east of Rupar in Ambālā District of Panjab. The Painted Grey Ware strata here are not very thick, and the extent of the site is also very limited.

GHANAULI (31°2′ North Lat. and 76°35′ East Long.).—It is a small village about 6 miles to the north-east of Rupar in Ambālā District of Panjab. The ancient ruins are very much disturbed; all the same the Painted Grey Ware can be easily picked up from exposures.

HASTINĀPURA.—Present report.

INDRAPAT (28°38′ North Lat. and 77°16′ East Long.).—The ancient mound on which stands the Purānā Qila at Delhi is known as Indrapat (Skt. Indraprastha). Though the periphery of the mound is hidden from view by the fort-wall, there do exist certain exposures on the eastern side, from where the Painted Grey Ware was obtained.

KAMPIL (27°36′ North Lat. and 79°16′ East Long.).—It lies 28 miles north-east of Fatehgarh in Farukhābād District, U. P., and is situated on an old bank of the Gangā. At the author's instance the site was visited by Shri Ram Babu, who collected the Painted Grey Ware from here.

KOṬLĀ NIHANG (30°57′ North Lat. and 76°32′ East Long.).—The site of Koṭlā Nihang, lying at a distance of about 2 miles to the south-east of Rupar in Ambālā District, was brought to the notice of archaeologists by Shri M. S. Vats, who excavated the remains of a Harappan settlement here.[1] Its proximity to other Painted Grey Ware sites naturally made the present author think that hereabouts must lie a place where a relationship between the Painted Grey and Harappan Wares could be established. While the author discovered such a site at Rupar (below, p. 141), Shri B. K. Thapar found the Painted Grey Ware at Koṭlā Nihang itself. The site was later visited by the author himself and his observations regarding the stratigraphical relationship of the two wares is as follows:—

In Shri Vats' trench can be seen a thick deposit of pebbles, which contains stray sherds of the Harappā Ware but none of the Painted Grey Ware. Remains of regular Harappan occupation were noticed by the author in a dry unlined well in the interior of the modern village. This tends to suggest that the Harappan sherds in the pebble-layer are perhaps redeposited there. Since there are no Painted Grey Ware sherds in the pebble-layer, it appears that this ware appeared at the site only subsequently.

KURUKSHETRA (29°58′ North Lat. and 76°50′ East Long.).—Kurukshetra is a railway station on the Delhi-Ambālā section of the Northern Railway. The ancient mounds, however, lies near Thāneshwar, which is hardly 3 miles from Kurukshetra. The biggest of the mounds, about ¾ mile long and ½ mile wide, is so much packed up with post-Gupta and early medieval deposits that it was difficult to observe the lowest levels here. It was, however, from the 'City' mound, lying opposite the big mound, that the Painted Grey Ware was obtained.

MATHURĀ (27°28′ North Lat. and 77°42′ East Long.).—It is a District headquarters in U.P. There are several mounds around the Mathurā town, the most imposing amongst which is the Katrā mound. The railway line cuts through this mound for some length and it was from the lowest levels in these exposed sections that the Painted Grey Ware was obtained. The ware also lay strewn over the top of the mound, which evidently was thrown there by the people who dug up the mound for laying the railway line.

NAGAR (31°5′ North Lat. and 75°51′ East Long.).—The ancient mound lies on the deserted bank of the Sutlej about 4 miles north-east of Phillaur, a Tehsil headquarters in Jullundur District of Panjab. The Painted Grey Ware can be picked up in profusion along the western and south-western faces. Explored by Shri B. K. Thapar.

PALWAL (28°8′ North Lat. and 77°19′ East Long.).—It is a Tehsil headquarters in Gurgaon District of Panjab. The ancient mound, lying close to the Delhi-Mathurā road, is fairly high and extensive, but, for the most part, it is covered up by modern

[1] M. S. Vats, *Excavations at Harappā*, I (Delhi, 1940), pp. 476-77.



Painted Grey Ware: 1, 2 and 6, from Ahichchhatrā; the rest from Pānīpat (see page 143)

buildings. On the southern side, however, there are a few exposed sections where the Painted Grey Ware can be picked up in abundance.

PĀNĪPAT (29°24' North Lat. and 76°58' East Long.).—It is a Tehsīl headquarters in Karnāl District of Panjab and is well-connected by road and rail with Delhi. The modern town covers up practically the whole of the ancient mound, which at places rises to a height of about 60 ft. (pl. LXXI B). On the north-eastern side, where the Gandhi Memorial Library and Power House are located, there is a fairly vertical section, wherein it was observed that the Painted Grey Ware lay immediately over the natural soil and the N.B.P. Ware higher up in the mound.

PEHOWĀ (29°59' North Lat. and 76°35' East Long.).—A small town in Kaithal Tehsil of Karnāl District, Panjab, it lies about 17 miles to the west of Thāneshwar. There are two mounds here, the larger of which is covered with modern houses. Sherds of Painted Grey Ware were obtained from the throw-out of manure-pits located near the southern and south-eastern periphery of the town.

RĀJĀ KARNA KĀ QILĀ (29°58' North Lat. and 76°49' East Long.).—It is a small mound about 3 miles to the west-south-west of Thāneshwar in Panjab. Sherds of the Painted Grey Ware were picked up from the low ground close to the mound.

RUPAR (30°58' North Lat. and 76°32' East Long.).—It is a Sub-Divisional headquarters in Ambālā District of Panjab. As already stated above (p. 7) the author was anxious to find out a site where both the Harappā and Painted Grey Wares could be obtained. The well-known Harappan site of Koṭlā Nihang, which is only about 2 miles from Rupar, made the author look for such a site in this area and the result was the discovery of the mound at Rupar. Though fairly extensive in area, a considerable part of the mound lies under the modern town. There is, however, an unoccupied block, measuring about 2 furlongs in length, ½ furlong in width and 50-55 ft. in height, very close to the Rupar College (pl. LXXI A). Here ancient pottery can be picked up in abundance from rain-gullies and the peripheral fields. Besides the Painted Grey Ware, which occurs all along the western and northern faces, the author also obtained from the northern and eastern faces typical Harappan material (below, p.146). This is, thus, an ideal site for finding out the stratigraphical relationship between the Harappā and Painted Grey Wares.

SAINI (29°2' North Lat. and 77°47' East Long.).—It is located at a distance of about 8 miles from Meerut on the way to Hastināpura. The mound is very much disturbed; all the same the Painted Grey Ware can be picked up in great abundance.

TEORĀ (30°7' North Lat. and 76°53' East Long.).—The mound, lying about 3 miles to the south of Shāhābād in Karnāl District, Panjab, was explored by Shri B. K. Thapar, who discovered the Painted Grey Ware here.

TILPAT (28°27' North Lat. and 77°22' East Long.).—The ruins of Tilpat are located at a distance of about 13 miles to the south of Delhi and are approachable from the Delhi-Mathurā road. The author's attention to this site was drawn by Shri Shankar Das. During his visit, the author picked up sherds of the Painted Grey Ware from an earthen dump near a well which the local people had excavated a few years ago but had abandoned for want of funds. The sides of this well were scraped and studied (pl. LXX B) and another trench was laid within a furlong from here. It was revealed that the Painted Grey Ware well preceded the N.B.P. Ware. Since the occupational strata continued even below the subsoil water-level, the natural soil was not reached.

Some specimens of the Painted Grey Ware collected from the above-mentioned sites are described below:—

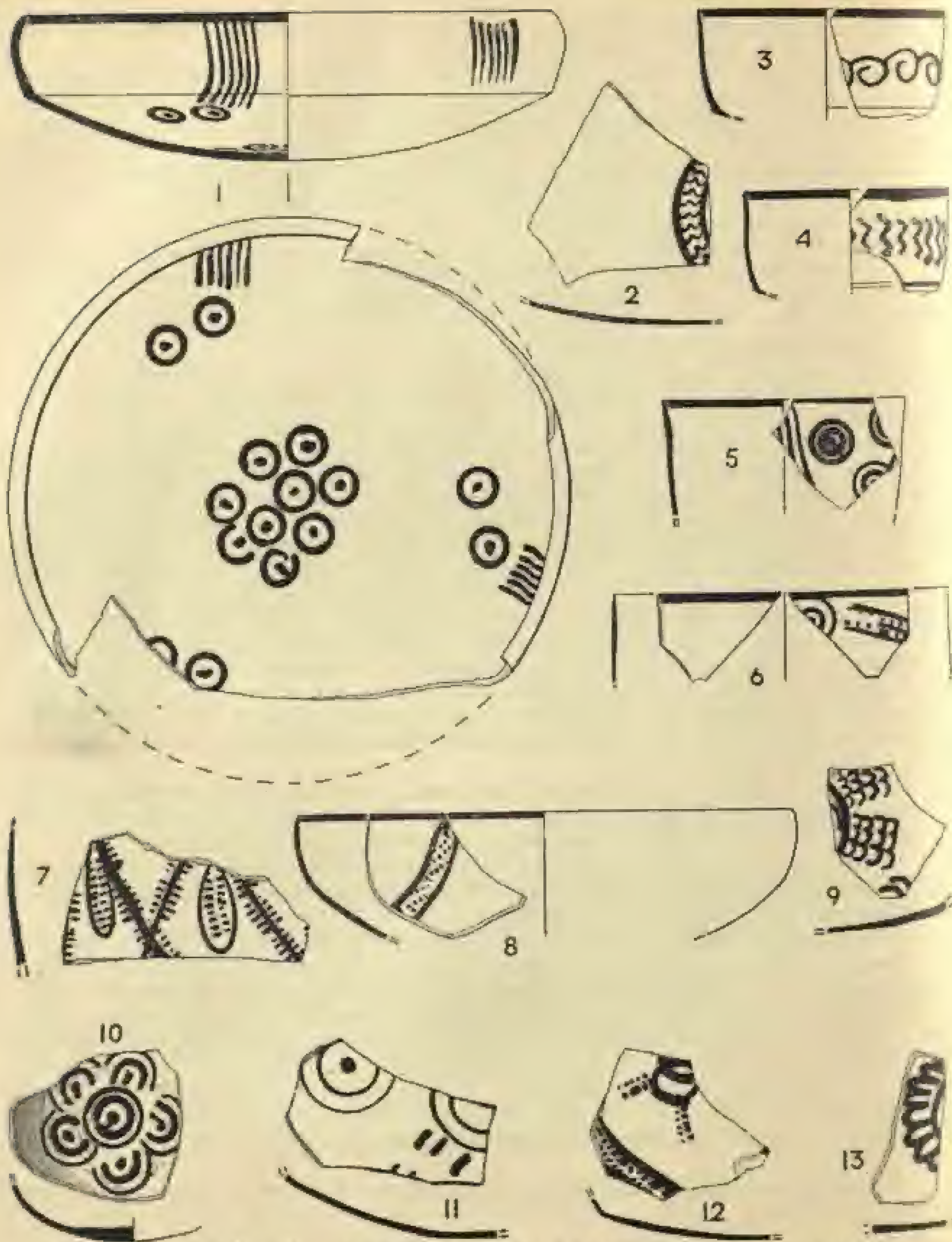


FIG. 37. *Painted Grey Ware: 1-4, from Ahichchhatrā; 5-12, from Pānīpat; 13, from Chhat.* ¼

Fig. 37

1. Dish of grey ware with an inturned featureless rim and a sagger-base. Painted in black on the inside with a horizontal rim-band above three equally-spaced groups, each of three vertical strokes and circles enclosing thick dots; the base has a central group of nine circles enclosing dots. On the outside is a group of six vertical strokes. From Ahichchhatrā.

2. Base-fragment of a dish of grey ware painted in black on the inside with two concentric arcs enclosing sigmas. From Ahichchhatrā. Also pl. LXXII, 6.

3. Bowl of grey ware with an internally sharpened rim and roughly straight sides. It is painted in black on the inside with a simple horizontal rim-band and on the outside with a horizontal rim-band and a chain of short spirals. From Ahichchhatrā. Also pl. LXXII, 2.

4. Bowl of grey ware with a vertical featureless rim and roughly straight sides grooved near the base. It is painted in black on the inside with a simple horizontal rim-band and on the outside with a horizontal rim-band and a row of sigmas. From Ahichchhatrā. Also pl. LXXII, 1.

5. Bowl of grey ware with a vertical internally sharpened rim and straight sides. It is painted on the inside with a simple band along the rim and on the outside with a rim-band and groups of concentric circles and oblique strokes. From Pānīpat. Also pl. LXXII, 3.

6. Bowl of grey ware with a vertical sharpened rim and straight sides. It is painted on the inside with a simple horizontal rim-band and on the outside with a rim-band above two concentric circles and three oblique lines enclosing dots. From Pānīpat.

7. Fragment of a bowl of grey ware, painted in black on the outside with lines indented on both sides with dashes and enclosing long loops with dots. From Pānīpat. Also pl. LXXII, 5.

8. Fragment of a dish of grey ware with rounded sides and a sagger-base. Painted on the inside with a rim-band up to which run two oblique strokes enclosing rows of dots. From Pānīpat.

9. Base-fragment of a dish of grey ware painted on the inside with two groups, each of four sigmas, bordering an arc of a circle. From Pānīpat. Also pl. LXXII, 7.

10. Base-fragment of a bowl of grey ware, painted in black on the inside with five groups each of two concentric semicircles bordering on two central concentric circles. From Pānīpat. Also pl. LXXII, 4 (where the design has not come out distinctly due to its subsequent fading).

11. Base-fragment of a dish of grey ware painted in black with dashes and two groups each of two concentric circles. From Pānīpat.

12. Base-fragment of a dish of grey ware, painted in black with two intersecting circles from which shoot double rows of dots. The whole design seems to be encircled by two bands enclosing dots. From Pānīpat. Also pl. LXXII, 8.

13. Base-fragment of a dish of grey ware painted in black with a circle scalloped on the outer periphery. From Chhat.

Pl. LXXIII A

Bowl of grey ware with a fine-grained core, a sharpened rim and straight sides; painted in black on the inside with a rim-band and on the outside with groups of oblique lines enclosing dots, drawn in such a way as to divide the profile into triangular compartments. From Pānīpat.

Pl. LXXIII B

Dish of grey ware with a medium-grained core, a slightly incurved rim and rounded sides carinated to a sagger-base; painted in black on the inside with a rim-band up to which run groups of oblique strokes; at the centre of the base is a design consisting of five groups of concentric circles bordering two concentric circles. From Ahichchhatrā.

B. Sites with the Northern Black Polished Ware (fig. 1)

An up to date list of the distribution of the N. B. P. Ware was published by R. E. M. Wheeler and Krishna Deva in *Ancient India*, no. 1, pp. 55-56. Since then many a new site has been discovered and a consolidated list is given below:—

Ahichchhatrā (28°22′ North Lat. and 79°7′ East Long.).—In Aonlā Tehsil of Bareli District, U.P. See *Ancient India*, no. 1, pp. 55-56.

Atranjī Kheḍā (27°42′ North Lat. and 78°41′ East Long.).—In Etah District, U.P. See *Ancient India*, no. 1, p. 55.

Bāghpat (28°57′ North Lat. and 77°13′ East Long.).—Tehsil headquarters in Meerut District, U.P. The N.B.P. Ware was picked up in the same area as the Painted Grey Ware referred to above, p. 138.

Bahal (20°37′ North Lat. and 75°2′ East Long.).—In East Khandesh District of Bombay State. Information from Shri M. N. Deshpande.

Bairāt (27°27′ North Lat. and 76°12′ East Long.).—In Jaipur District, Rājasthān. See D. R. Sahni, *Excavations at Bairat* (Jaipur, 1936), p. 24, pl. XI, e and f, where fragments of bowls of fine fabric, with a beautiful golden lustre and repaired with copper rivets, are referred to.

Bāngarh (25°36′ North Lat. and 88°14′ East Long.).—In Dinājpur District of West Bengal. See K. G. Goswami, *Excavations at Bangarh* (Calcutta, 1948), p. 27.

Barnāwā (29°7′ North Lat. and 77°26′ East Long.).—In Sardhanā Tehsil of Meerut District, U.P. The N.B.P. Ware was found to occur at a higher level than the Painted Grey Ware. See p. 139.

Bhīṭā (25°18′ North Lat. and 81°37′ East Long.).—In Allahabad District, U.P. See *An. Rep. Arch. Surv. Ind.*, 1911-12 (Calcutta, 1915), pp. 29 ff.

Buxar (25° 34′ North Lat. and 83°59′ East Long.).—In Shāhābād District, Bihar. Sherds collected by Shri B. N. Puri.

Charan (31°3′ North Lat. 76°14′ East Long.).—In Tehsil Rahaon, Jullundur District, Panjab. Sherds collected by Shri B. K. Thapar.

Chhat (30°37′ North Lat. and 76°47′ East Long.).—In Rājpur Tehsil of Patiālā District, PEPSU. A study of the exposed sections coupled with trial-soundings showed that the Painted Grey Ware well-preceded the N.B.P. Ware.

Giriak (25°2′ North Lat. and 85°31′ East Long.).—In Patna District of Bihar. See *Ancient India*, no. 1, p. 56.

Hastināpura.—Present report.

Indrapat (28°38′ North Lat. and 77°16′ East Long).—The mound on which stands the Purānā Qila in Delhi. The N.B.P. sherds were picked up from the 'talus' on the eastern side.

Jhūsī (25°29′ North Lat. and 81°55′ East Long.).—On the left bank of the Gangā, opposite Allahabad, U.P. See *Ancient India*, no. 1, p. 55.

Kampil (27°36′ North Lat. and 79°16′ East Long.).—In Farukhābād District, U.P. Sherds collected by Shri Ram Babu.

Karhā (25°42′ North Lat. and 81°22′ East Long.).—In Allahabad District, U.P. Information from Shri S. C. Kala.

Kauśāmbī (25°22′ North Lat. and 81°23′ East Long.).—On the northern bank of the Yamunā, about 35 miles south-west of Allahabad, U.P. Here a pre-N.B.P. Ware deposit has also been observed, which contains sherds of grey ware including one painted specimen (above, p. 22). Information from Shri G. R. Sharma.

Khokrā Kot (28°53′ North Lat. and 76°34′ East Long.).—In Rohtak District of Panjab. Collection by Shri H. Waddington.

Lachchhāgiri (25°21′ North Lat. and 82°12′ East Long.).—In Haṇḍiā Tehsil of Allahabad District, U.P. The ancient mound, fairly high and extensive, is being gradually cut away by the Gangā. The N.B.P. Ware occurs fairly low in the exposed sections.

Maheśwar (22°11′ North Lat. and 75°56′ East Long.).—On the northern bank of the Narmadā in Nīmār District of Madhya Bharat. Information from Professor H. D. Sankalia and Dr. B. Subba Rao.



A. *Bowl of Painted Grey Ware, Pānīpat* (*see page 143*)

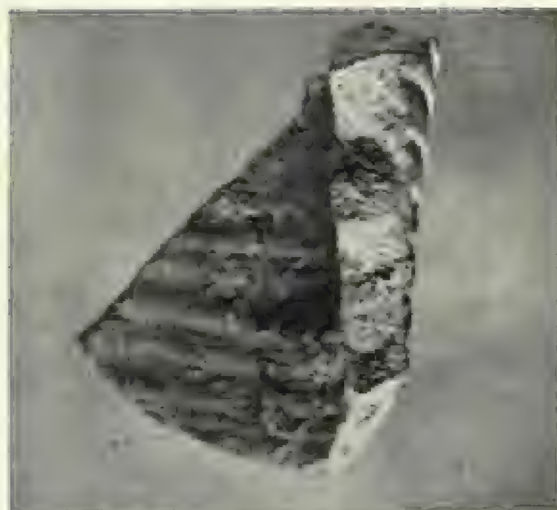


B. *Dish of Painted Grey Ware, Ahichchhatrā* (*see page 143*)

To face page 145



A. *Painted grey ware from Thessaly, Greece (see page 147)*



B. *Corrugated stem of grey ware, Thessaly, Greece (see page 147)*

MASAON (25°34′ North Lat. and 83°13′ East Long.).—In Ghāzīpur District, U.P. See *Ancient India*, no. 1, p. 55.

MATHURĀ (27°28′ North Lat. and 77°42′ East Long.).—A District headquarters in U.P. The N.B.P. sherds were first picked up by Professor Stuart Piggott. The present author observed that they occurred at a level higher than the Painted Grey Ware.

NĀGDĀ (22°55′ North Lat. and 76°3′ East Long.).—In Madhya Bharat. Information from Shri V. S. Wakankar.

NĀSIK (19°59′ North Lat. and 73°47′ East Long.).—On the bank of the Godāvarī. District headquarters in Bombay State. Information from Professor H. D. Sankalia.

NĀVDĀ ṬOLĪ (22°10′ North Lat. and 75°56′ East Long.).—On the south bank of the Narmadā opposite Maheśwar in Nīmār District of Madhya Bharat. Information from Professor H. D. Sankalia and Dr. B. Subba Rao.

PĀNĪPAT (29°24′ North Lat. and 76°58′ East Long.).—A District headquarters in Panjab. As already stated above (p. 141), the N.B.P. Ware occurs higher than the Painted Grey Ware.

PATNA (25°36′ North Lat. and 85°10′ East Long.).—Capital of Bihar. The sites of Kumrāhār and Bulandī Bāgh, very near the Patna town, have long been known to contain the N.B.P. Ware. Recently the K.P. Jayaswal Research Institute has carried out some more excavation.

RĀJGHĀṬ (25°18′ North Lat. and 83°1′ East Long.).—On the northern bank of the Gangā near Banaras, U. P. The site was exposed while laying a railway line, and it was observed that the N.B.P. Ware occurred fairly low in the mound.

RĀJGIR (25°2′ North Lat. and 85°25′ East Long.).—Lying at a distance of about 60 miles to the south-east of Patna in Bihar, Rājgir is well-known for its antiquity. The site abounds in the N.B.P. Ware, there being some pre-N.B.P. deposits too. See *Ancient India*, no. 7 (1951), p. 66.

RUPAR (30°58′ North Lat. and 76°32′ East Long.).—A Sub-divisional headquarters in Ambālā District, Panjab. For details of the mound see above, p. 141.

SAINĪ (29°2′ North Lat. and 77°47′ East Long.).—8 miles from Meerut on way to Hastināpura. In the exposed sections it was observed that the N.B.P. Ware followed the Painted Grey Ware. See above p. 141.

SĀNCHĪ (23°29′ North Lat. and 77°45′ East Long.).—Located 28 miles north of Bhopal, Sānchī is well-known for the Buddhist stūpas. The N.B.P. Ware occurs in the ancient deposits here.

SĀRNĀTH (25°23′ North Lat. and 83°2′ East Long.).—5 miles north of Banaras, U.P., the site has extensive remains, which have been partly excavated.

ŚIŚUPĀLGARH (20°13′ North Lat. and 85°51′ East Long.).—About 2 miles to the east of Bhuvaneswar, District Puri, Orissa. The N.B.P. sherds from here are not many; all the same they serve to emphasize the distribution of the ware. See the author's report in *Ancient India*, no. 5, p. 79.

SONEPAT (28°59′ North Lat. and 76°1′ East Long.).—A Tehsil headquarters in Rohtak District of Panjab. The ancient mound, fairly high and extensive, is covered with modern houses. The N.B.P. Ware could, however, be easily picked up from vertical sections along the periphery of the mound.

TAMLUK (22°17′ North Lat. and 87°55′ East Long.).—On the bank of the Rupnārāyana river in Midnāpur District, West Bengal, the site is identifiable with Tāmralipti of ancient literature. It contains the N.B.P. Ware as well as grey ware similar to that of Period III at Hastināpura.

TAXILA (33°45′ North Lat. and 72°50′ East Long.).—In Rawalpindi District of west Panjab. The N.B.P. Ware occurs essentially at Bhīr Mound, the earliest of the

three sites at Taxila. See *Ancient India*, no. 1. p. 56 and J. Marshall, *Taxila* (Cambridge, 1951).

Tilpat (28°27′ North Lat. and 77°20′ East Long.).—About 13 miles south of Delhi and approached from Delhi-Mathurā road. In a trial-dig, the N.B.P. Ware was found to occur at levels higher than those of the Painted Grey Ware (above, p. 141).

Tripurī (23°9′ North Lat. and 79°50′ East Long.).—In Jabalpur District of Madhya Pradesh. Information from Dr. M. G. Dikshit.

Ujjain (23°11′ North Lat. and 75°46′ East Long.).—Located in Madhya Bharat, the site is identifiable with Ujjayinī of ancient literature. Information regarding the occurrence of the N.B.P. Ware obtained from Dr. B. Subba Rao.

Vaiśālī (25°58′ North Lat. and 85°8′ East Long.).—In Muzaffarpur District of Bihar. The site was excavated by Shri Krishna Deva, who observed the N.B.P. Ware going fairly low in the mound.

C. Sites with the Ochre-coloured Ware (fig. 1)

The hoards of copper implements discovered in the Gangetic basin have been engaging the attention of the author for some time past. With a view to finding out the cultural affiliation of these hoards, he carried out trial-excavations at the well-known sites of Bisaulī and Rājpur Parsu in Uttar Pradesh. No implements were encountered in these digs but a new class of pottery, called the Ochre-coloured Ware, was met with at both the sites.[1] At Hastināpura, too, the lowest levels yielded sherds of similar fabric and colour (above, p. 11). However, the specimens from all the three sites are too fragmentary to give an idea of the complete shapes of the pots.

With further exploration, it is hoped, the following list will be considerably enlarged:—

Bisaulī (28°18′ North Lat. and 78°56′ East Long.).—A Tehsil headquarters in Budaun District, U.P. See *Ancient India*, no. 7, pp. 25-26.

Hastināpura.—Present report.

Rājpur Parsu (29°9′ North Lat. and 78°10′ East Long.).—A village on the east bank of the Gangā opposite Hastināpura, U.P. See *Ancient India*, no. 7, p. 36.

D. Sites with the Harappā Ware (fig. 1)

In *Ancient India*, no. 3, Wheeler published a list of thirtyseven sites yielding the Harappā Ware. The present author's search for a Painted Grey-*cum*-Harappā Ware site brought to light the mound at Rupar, already described above (p. 141). The Harappan material from here consisted of pottery including two painted sherds and a fragment of dish-on-stand, four pieces of faience bangles and a brick, 11¼ × 5½ × 2¾ in.

To the list may also be added Bikkun (31°3′ North Lat. and 76°37′ East Long.), lying at a distance of about 8 miles to the north-east of Rupar along the Rupar-Nālāgarh road. Munshi Sadar Din's collection from this site revealed that it contained the Harappā Ware.

A. Ghosh's explorations along the Ghaggar bed in Rājasthān has brought to light a large number of Harappan sites, and the list, now standing at thirtynine, will shoot up much higher.

[1] B. B. Lal, 'Further Copper Hoards from the Gangetic basin and a review of the problem', *Ancient India*, no. 7 (1951), pp. 25-26 and 37.

4. PAINTED AND PLAIN GREY WARES IN WESTERN ASIA AND SOUTHERN EUROPE

After the first season's dig at Hastināpura, the author had an opportunity of visiting the museums in the U.K. and western Europe. In the course of an examination of the reserve-collection of pottery at the Museum of Archaeology and Ethnology, Cambridge, he came across fragments of dishes and bowls of fine grey ware with designs painted over in black pigment. The ware had a striking similarity with the Painted Grey Ware of Hastināpura. The author got in touch with Dr. G. H. S. Bushnell, Keeper of the Museum, for details regarding the provenance of the specimens and learnt that they had come from Wace and Thompson's excavation in Thessaly, the sites concerned being Tsani, Tsangli and Zerila.[1] Dr. Bushnell very kindly lent to the author a few sherds, two of which are illustrated on pl. LXXIV A. Later on he also supplied a photograph of a corrugated stem (pl. LXXIV B), which resembles the specimen from Hastināpura (pl. XXX B).

As will be seen below (p. 150), there is a likelihood of the Painted Grey Ware having been associated with the Aryans during their early days in India. Such a possibility at once throws into limelight the Greek specimens, since, as is well-known, the Aryans also penetrated into Greece within the same millennium. On the Greek side, therefore, further investigations are necessary in this direction.

Shah Tepe in Iran has also yielded fine grey ware having practically the same fabric and look as the Indian specimens. Amongst the sherds examined at the Cambridge Museum, however, none had any painted designs, but it is not altogether unlikely that there may exist in northern Iran a variant of the Painted Grey Ware under discussion or its ancestor. Such a possibility is suggested by the presence of the corrugated stem of the Hastināpura type at Shah Tepe itself[2] and also by the occurrence of a variant painted grey ware south of Lake Urmia.[3] Moving eastwards, painted grey ware has also been found in Sīstān, not far from the Indian sub-continent.[4]

The above-mentioned painted and plain grey wares with their sub-varieties, from Greece to Sīstān *via* Iran, are assignable very broadly to the second millennium B.C. Within this period also falls the well-known inscription at Boghaz Keui (1360 B.C.) which records the names of Aryan deities like Indra, Varuṇa, Mitra, etc.[5] This coincidence, though not having much weight in itself, cannot be altogether set aside, and it may be well worth the trouble to study the distribution of painted and plain grey wares while trying to work out the movement of Aryan-speaking people in western Asia and southern Europe.

5. LITERARY EVIDENCE REGARDING HASTINĀPURA AND ASSOCIATED SITES

It is not the intention of the author to go into a detailed discussion of the literary evidence regarding Hastināpura and other Painted Grey Ware sites mentioned in the previous chapters. That would indeed be too much for an excavation-report like this. All that is desired here is to show, specially to readers who are not ordinarily expected to be familiar with Indian literature and tradition, that most of these sites have been referred to in ancient Indian texts—Brāhmaṇical, Jaina and Buddhist—and that a good many of them were in one way or other connected with events culminating in the Mahābhārata war.

[1] A. J. B. Wace and M. S. Thompson, *Prehistoric Thessaly* (Cambridge, 1912).

[2] T. J. Arne, *Excavations at Shah Tepe, Iran* (Stockholm, 1945), pls. XLIV, 317-19, and XLVI, 328, 331, etc.

[3] Examples lodged in the British Museum, London.

[4] In Sir Aurel Stein's collection in the Central Asian Antiquities Museum, New Delhi, examined by the author.

[5] cf. V. Gordon Childe, *The Aryans* (London, 1926), p. 18.

To begin with the key-site of Hastināpura. According to the *Mahābhārata*, the city was named after king Hastin of the Paurava dynasty, who is also said to have founded it.[1] If, however, the township was already in existence for some time prior to Hastin, as is held by some scholars, then the king probably had the credit of expanding it and bringing it into prominence. That the name Hastināpura was a sequel to the association of the place with king Hastin is rather obvious, and it is also borne out by Jaina tradition.[2]

Hastin had two sons, Ajāmīḍha and Dvimīḍha. From the former were born Ṛiksha, Nīla and Bṛihadvasu. While Ṛiksha continued to rule at Hastināpura, Nīla and Bṛihadvasu respectively founded the kingdoms of north and south Pañchālas with capitals at Ahichchhatrā and Kāmpilya (modern Kampil).[3] During the days of the Mahābhārata, Drupada was the king of the latter country and married his daughter to the sons of Pāṇḍu.

In the main line at Hastināpura, there were several notable kings, amongst whom special mention may be made of Kuru, son of Saṁvaraṇa. He extended the Paurava kingdom far and wide, and it was after him that the area acquired the name Kurukshetra, 'land of Kuru'. That the dynasty itself later on came to be known as Kaurava, 'of Kuru', also testifies to the great impression he must have left on the people.

Seventeenth[4] in descent from Kuru was king Vichitravīrya, who had two sons Dhṛitarāshṭra and Pāṇḍu, with whom begins the proper story of the *Mahābhārata*. This well-known story need not be repeated here, but mention may be made of such geographical names in the story as have bearing on the present context.

In order to prevent a conflict between his sons and the sons of Pāṇḍu, Dhṛitarāshṭra divided the kingdom into two, giving Hastināpura and the adjacent territories to his own sons and Indraprastha (identified by tradition with the ancient mound of Indrapat on which stands the Purānā Qila at Delhi)[5] and its environs to the sons of Pāṇḍu.

The next important reference is to Vāraṇāvata (identified with Barnāwā in District Meerut)[6], where the Kauravas built a lac-house and induced their cousins to live in it with a view to burning them to death.

On their return from the exile, the Pāṇḍavas requested the Kauravas to return to them at least five villages so that they might have some place to live in. The names of these villages vary in different recensions of the *Mahābhārata*. According to one, they were Kuśasthala, Vṛikasthala, Āsandī, Vāraṇāvata and one more,[7] while according to another, they included Avisthala, Vṛikasthala, Mākandī, Vāraṇāvata and one more place not named.[8] In the *Veṇīsaṁhāra*, they are enumerated as Indraprastha, Vṛikaprastha, Jayanta, Vāraṇāvata and one more (unnamed).[9] The tradition prevalent round about Delhi puts them as Indrapat, Tilpat, Bāghpat, Pānīpat and Sonepat.[10] Some of these

[1] *Mahābhārata* (Bhandarkar Oriental Research Institute, Poona), Ādi-parva, 90, 36.

[2] *Viridha-tīrthakalpa* (Santiniketan, 1934), p. 94.

[3] All these details are given in the *Mahābhārata* and the Purāṇas with slight variations from text to text. For an easy summary the readers' attention is drawn to F. E. Pargiter, *Ancient Indian Historical Tradition* (London, 1922) and *The Purāṇa Text of the Dynasties of Kali Age* (Oxford, 1913).

[4] According to Pargiter, twelfth.

[5] N. L. Dey, *Geographical Dictionary of Ancient and Mediaeval India* (London, 1927), pp. 77-78.

[6] *Ibid.*, p. 25.

[7] *Mahābhārata* (Bhandarkar Oriental Research Institute, Poona, 1937), Udyogaparva, 31, 19.

[8] *Mahābhārata*, ed. T. R. Krishnacharya and T. R. Vyasacharya (Nirṇaya Sāgara Press, Bombay, 1907), Udyogaparva, 31, 19.

[9] *Veṇīsaṁhāra*, ed. K. N. Dravida (Oriental Book Supplying Agency, Poona, 2nd ed., 1922), p. 7.

[10] N. L. Dey, *op. cit.*, p. 148.

places have been identified by scholars as follows:[1] Vṛikaprastha with Bāghpat on the bank of the Yamunā in Meerut District, U.P.; Vāraṇāvata with Barnāwā at the confluence of the Krishnī and Hiṇḍan rivers in the same District; and Indraprastha with Indrapat (Purānā Qila, Delhī). Āsandī may have been Hastināpura itself or Asandh on the bank of the Chitang.[2] Tilpat, the ancient name of which is said to be Tilaprastha, is located at a distance of about 13 miles south of Delhi.[3] Pānīpat (which may be derived from ancient *Pāṇiprastha*) and Sonepat (which may represent *Soṇaprastha*) are stations on the Delhi-Ambālā section of the Northern Railway.[4]

The great Mahābhārata war was fought at and around Kurukshetra[5] on the Sarasvatī in Panjab. Kṛishṇa Vāsudeva, who wielded a great personal influence with the parties, originally belonged to Mathurā.[6] Abhimanyu, son of Arjuna, a Pāṇḍava brother, is said to have been killed at Āmin,[7] a place 5 miles south of Thāneshwar in Panjab. Arjuna retaliated by killing Karṇa, with whom is associated the site known as Rājā Karṇa kā Qilā.

At the close of the battle the Pāṇḍavā brothers abdicated, and Parīkshit, son of Abhimanyu, ascended the throne of Hastināpura. He was followed successively by Janamejaya, Śatānīka, Aśvamedhadatta, Adhisīma-kṛishṇa and Nichakshu. During the reign of the last-named king, a great flood occurred in the Gangā which carried away a considerable portion of Hastināpura. The capital was consequently shifted to Kauśāmbī.

Gaṅgay = āpahṛite tasmin nagare Nāgasāhvaye

Tyaktvā Nichakshur = nagaram Kauśāmbyāṁ sa nivatsyati.

'When the city Hastināpura is carried away by the Gangā, Nichakshu will abandon it and will dwell in Kauśāmbī.'[8]

The Purāṇas then continue the list of the rulers at Kauśāmbī, till we reach the name of Udayana, twentyfourth in succession from Parīkshit and a well-known contemporary of Buddha. According to a tradition recorded in the *Lalitavistara*, Udayana was born on the same day as Buddha.[9] The *Petavatthu Commentary* says that Buddha predeceased Udayana.[10] The usually accepted date of Buddha's death is 483 or 487 B.C. With this date as the basis and with eighteen years as the average per ruler, Pargiter is inclined to date the *Mahābhārata* battle to *circa* 950 B.C.[11]

---

[1] Dey, *op. cit.*, pp. 25, 77-78, 110 and 148.

[2] H. C. Raychaudhuri, *Political History of Ancient India*, 6th ed. (Calcutta, 1953), p. 23.

[3] Cf. *The Statesman*, Delhi ed., July 5, 6 and 9, 1950; also Dey, *op. cit.*, p. 204.

[4] Dey, *op. cit.*, pp. 110, 148 and 188.

[5] *Ibid.*, p. 110.

[6] *Ibid.*, p. 127.

[7] *Ibid.*, p. 218.

[8] Pargiter, *op. cit.* (1913), pp. 5 and 65.

[9] W. W. Rockhill, *The Life of the Buddha* (London, 1884), pp. 16-17.

[10] Dhammapāla's *Paramatthadīpanī*, ed. E. Hardy (Pali Text Society), pp. 140-41.

[11] Pargiter, *op. cit.* (1922), p. 182. It would perhaps be unfair not to mention here other dates suggested by scholars for the Mahābhārata war. They are, 3102, *circa* 1424, *circa* 1400, 1152 and ninth century B.C., supported respectively by P. C. Sengupta, K. P. Jayaswal, A. S. Altekar, S. N. Pradhan and H. C. Raychaudhuri. Space does not permit a detailed discussion of the merits of these datings but it would be clearly seen that the first figure, viz. 3102, is completely out of the question since it belies all our knowledge of protohistoric India. The next two figures, 1424 and 1400 B.C., also appear to be very high, since, if they are accepted, the average length per ruler between the war and king Udayana will work out to be more than 37 years, which is too long a duration indeed! Pradhan's dating gives an average of 28 years, which also appears to be on the higher side. The date proposed by Raychaudhuri, viz. ninth century B.C., seems to suffer from a shortening of the chronology, though indeed it may not be very much off the point.

6. PROVISIONAL CONCLUSIONS

The excavation at Hastināpura and explorations at other sites yielding the Painted Grey, Harappā, N.B.P. and Ochre-coloured Wares have brought to light the following facts:—

1. That the Painted Grey Ware was later than the Ochre-coloured Ware (evidence from Hastināpura, above, p. 11; cf. fig. 2). The latter seems to have been associated with the well-known 'Copper Hoards' of the Gangetic basin (evidence from Rājpur Parsu, etc., above, p. 11).

2. That the Painted Grey Ware was later than the Harappā Ware (evidence from Koṭlā Nihang, above, p. 140; cf. also fig. 3).

3. That the Painted Grey Ware well-preceded the Northern Black Polished Ware, though there may have been a subsequent overlap between the two. At Hastināpura there was no overlap (cf. figs. 2 and 3), but since there was a break of occupation between Periods II and III it is difficult to say what the position was during the interval. The point, therefore, needs verification from other comparable sites.

4. That a heavy flood in the Gangā washed away a considerable portion of the Painted Grey Ware settlement (Period II) at Hastināpura, which incident also resulted in the desertion of the site for some time to come (above, p. 14).

5. That the pre-N.B.P. levels at Kauśāmbī, which contained grey ware with at least one painted specimen, are assignable to a date prior to Period III of Hastināpura (above, p. 22.)

6. That the Painted Grey Ware occurs at a large number of sites in the upper Gangā basin, e.g. Hastināpura, Ahichchhatrā, Kampil, Mathurā, Bāghpat, Barnāwā, Kurukshetra, Pānīpat, Tilpat, Indraprastha, etc. (above, pp. 138 ff.).

7. That the people who occupied the Ghaggar valley in the wake of the Harappans used the Painted Grey Ware (above, p. 139).

8. That on the basis of 2 and 3 above, the Painted Grey Ware may be placed somewhere within the limits of 600 B.C. on the one hand and 1500 B.C. on the other. The corresponding strata (Period II) at Hastināpura may, however, be dated approximately from *circa* 1100 B.C. to *circa* 800 B.C. (above, pp. 22 ff.).

Here it may be worth while to recall some relevant information from ancient Indian literature (above, pp. 147 ff):—

(a) That Hastināpura, Ahichchhatrā and Kampil were respectively the capitals of the Pauravas, and north and south Pāñchālas, who formed a part of the early Aryan stock in India.

(b) That in the régime of Nichakshu, the fifth ruler after the Mahābhārata battle, there occurred a flood in the Gangā which washed away Hastināpura and the capital was shifted to Kauśāmbī.

(c) That Mathurā, Indraprastha, Ahichchhatrā, Kampil, Bāghpat, Barnāwā, Tilpat, Kurukshetra, etc. were in one way or other connected with the *Mahābhārata* story.

(d) That the combined stream of the Ghaggar and Sarsuti is identifiable with the Sarasvatī and the Sutlej with the Śutudru, on the banks of which the early Aryans used to live.

One may also recall here the inscriptional evidence from Boghaz Keui (above, p. 147), which shows that the Aryan-speaking people had made their appearance in western Asia by the fourteenth century B.C. Moving eastwards, they are likely to have reached the Ghaggar and Sutlej valleys during the following couple of centuries.

Now, when the archaeological data are viewed against the background of literature, some obvious questions begin to pose themselves. Is it a mere chance—

(i) that a large number of sites associated with the Mahābhārata story contain the same ceramic industry, viz. the Painted Grey Ware, in their lower levels?

(ii) that the date of the *Mahābhārata* battle falls within Period II at Hastināpura?

(iii) that the people who appeared in the Ghaggar-Sutlej valleys in a post-Harappan context—a period which synchronizes with the arrival of the Aryan-speaking people in that area, as per literary and inscriptional evidence cited above—used the Painted Grey Ware?

Further, may not the archaeological evidence, nos. 4 and 5 above, be taken to indicate that the Purānic tradition regarding the washing away of Hastināpura and the subsequent shifting of the capital to Kauśāmbī may have some historical basis?

If it is believed that all these coincidences are nothing more than mere chances, the questions wind themselves up. Otherwise, a conclusion that would appear to force itself on us is: that the sites of Hastināpura, Mathurā, Kurukshetra, Barnāwā, etc., are identifiable with those of the same name mentioned in the *Mahābhārata*. If that be so, the Painted Grey Ware would be associable with the early settlers on these sites, viz. the Pauravas, Pāñchālas, etc., who formed a part of the early Aryan stock in India.[1] Such an association may also explain the synchronism between the appearance of the Painted Grey Ware in the Ghaggar-Sutlej valleys and the probable date of the arrival of the Aryans in that area. *May it, however, be emphasized that the evidence is entirely circumstantial and until and unless positive ethnographic and epigraphic proofs are obtained to substantiate the conclusions they cannot but be considered provisional?*

[1] Colleagues in India have been persistently bringing to the notice of the present author the views of Professor V. Gordon Childe and Sir Mortimer Wheeler in regard to the Cemetery H culture and have been asking him that if that culture represented the Aryans, how could the Painted Grey Ware culture do the same ? With all reverence to Sir Mortimer, who is the present author's *guru* in field-archaeology, and to Professor Childe, whose philosophical approach to archaeological problems has greatly inspired the author, the latter ventures to feel that the evidence from the 1946-excavation at Harappā itself goes against their views. For example, if the Cemetery H people were the invaders and Harappans the invaded, one would naturally expect a stage representing an overlap between the two cultures. This, however, is far from the case. The section connecting Cemetery R 37 with Cemetery H (*Ancient India*, no. 3, pl. XXXIX) clearly shows that a débris-layer, measuring as much as 7-9 ft. in thickness, intervened between the two. The débris must have taken at least some time to accumulate. Such a time-lag is again suggested by the habitational deposits on mound AB itself. For example, pl. XXXII of *Ancient India*, no. 3, fully demonstrates that the structures assignable to the Cemetery H culture were separated from those of the Harappā culture by a débris-layer of about 3 ft. in thickness. Besides, there is another angle from which the problem has to be viewed. The early Aryans are known to have dwelt on the banks of the Sarasvatī and later on to have moved to the upper reaches of the Gangā and Yamunā. Thus, if the cemetery H culture was to represent the Aryan invaders, should not one expect the remains of this culture in the Sarasvatī and upper Gangā-Yamunā valleys? But A. Ghosh's combing of the Sarasvatī and Drishadvatī valleys and the present author's explorations in the upper basins of the Gangā, Yamunā and Sutlej have not yielded even a single sherd of the cemetery H ware in these areas. No doubt, the counter-argument is of a negative kind; all the same can one ignore it?

ANGLING IN ANCIENT INDIA[1]

By Sunder Lal Hora

The Director of the Zoological Survey of India has of late been investigating the problems relating to fish in ancient India. One of the aspects that are engaging his attention is the identification of the fish-designs painted on the pottery of the Indus valley and Baluchistan, and the results of his study, still to be published, promise to be interesting and significant. In the present article he deals with the history of angling in India as available from archaeological and literary sources.

CONTENTS

THE practice of catching fish by means of a baited hook or 'angle' is perhaps among the most ancient of human activities. It not only requires skill on the part of an operator but also implies a great deal of scientific knowledge about the bionomics and behaviour of the game-fish. Prehistoric man in several parts of the world seems to have gathered sufficient knowledge about fish through observation and made use of it in catching fish for food by the use of hook and line. Later on, when large-scale fishing operations through the use of nets became possible and metallic hooks could be used, angling became a pastime for the rich and the poor alike. It is not my intention to trace the evolution of the art of angling on a comprehensive world-wide basis but just to indicate its probable development in India since its earliest records available from the excavations at Mohenjo-daro, Harappā and other sites in the Indus valley of the third and second millennia B.C.

1. FISH-HOOKS FROM THE INDUS VALLEY

Sarkar (1953, pp. 133-39) has recently dealt with the fish-hooks excavated in the Indus valley sites and has shown the great similarity of some of them to modern hooks. He has also discussed in a comparative way the use of fish-hooks among the primitive tribes of India and contemporary fish-hooks excavated from other countries of the Middle East and Egypt. He has classified fish-hooks of the Indus valley as follows:—

> 'The fish-hooks of the Indus valley can be classified into two main types: (1) Barbed and (2) Unbarbed. Specimens of 16 fish-hooks from Mohenjo-daro have been mentioned by Marshall (1931) and Mackay (1938), while the Harappā report includes only 1 specimen. Chanhu-daro has yielded 7 specimens including Majumdar's (1934) collection. Of the Mohenjo-daro specimens, all the 16 are barbed, while of the Chanhu-daro finds 3 are barbed and 4 are unbarbed. The solitary specimen from Harappā is unbarbed.'

[1] Especially written at the request of Mr. Paolo Bonetti, Chief Editor, 'Scientia' (Revue Internationale de Synthese Scientifique), Asso (Como, Italie).

On the basis of this analysis, Sarkar is of the opinion that 'The paucity of fish-hooks at Harappā may show that angling was not popular at this place. This may be due to the nature of the two rivers as well, the Ravi and the Indus. The latter was probably a richer source of fishing than the former.'

I have personally worked on the fish and fisheries of the Rāvi at Lahore and can say the fisheries of this river are fairly rich. The paucity of fishing hooks at Harappā cannot, therefore, be ascribed to the scarcity of fish-population in the river.

My studies (not yet published) on the archaeological finds from the Harappā site in relation to fish and fisheries have given the following interesting results:—

i. The fish painted on the pottery are of the marine type.

ii. Baskets or traps for catching fish were in use, as a fisherman carrying two such baskets is painted on a potsherd.

iii. Fishing nets were also in use.

These evidences indicate that marine fishing was the occupation of the Harappā fishermen and that fresh-water fish received little attention. For this reason, while implements for catching fish from the sea seem to have been fairly well-developed at Harappā, angling for fresh-water fish did not find much favour, though an attempt seems to have been made in preparing a primitive type of the unbarbed hook.

In the case of Mohenjo-daro, on the other hand, we have not seen any pottery with fish-drawings; nor are there paintings of any fishing implement. Net-sinkers are known from Mohenjo-daro and Chanhu-daro, and a fishing boat on a Mohenjo-daro seal has also been identified. From the fish-bones excavated from kitchen-middens, catfishes of the type of *Wallago*, *Rita* and *Arius* have been recorded and possibly some carp also. These records indicate that the people of Mohenjo-daro had mostly fresh-water fish of the river and of the flood-plains. The fishing boat would indicate that sometimes *Arius* from the neighbouring estuarine or marine waters were also imported. Here we find the perfect development of barbed hooks, some of which are figured here (pl. LXXV).[1] It may also be noted that the hooks were meant for different sizes and varieties of fish.

Chanhu-daro is closer to the sea than Mohenjo-daro, and it seems probable that some four to five thousand years ago the Arabian Sea might have extended as far as Hyderabad in Sind. At Chanhu-daro, therefore, we find the intermediate stages between the development of a barbed fish-hook from an unbarbed hook.

From the above discussion it would seem probable that the origin and evolution of the art of angling were more closely associated with inland, more particularly impounded, waters and that tidal waters were fished in with nets, traps, baskets, etc. With regard to the fish-hooks from the Indus valley, Sarkar has concluded as follows:—

> 'It appears from the above facts that the best type of metallic fish-hooks was probably developed at the Indus valley. In fact it attained the best perfection of all the fish-hooks at similar sites in Egypt and Mesopotamia. Their agreement with modern fish-hooks may be the continuity of a culture-trait similar to that found in pottery designs by Mackay (1930).'

2. ANGLING IN THE HISTORICAL PERIOD

The Vedic literature shows that fishing by nets was fairly common, but I have not so far come across any reference therein to angling. In the *Rāmāyaṇa* there is a reference to the shooting of fish with bow and arrow (Hora, 1952, p. 64 note), and the use of bow and arrow is also commonly described in the *Mahābhārata*. In the Buddhist works, however,

[1] The photographs of the hooks were kindly supplied by the Director General of Archaeology. For measurements of the hooks see Sarkar (1953, p. 135).

there are references to fishing by nets, there being no reference to angling. Though my enquiry into the extensive Indian literature is not yet complete, I have so far found no evidence of the practice of angling from the period of the Harappā civilization till the beginning of the twelfth century A.D.[1]

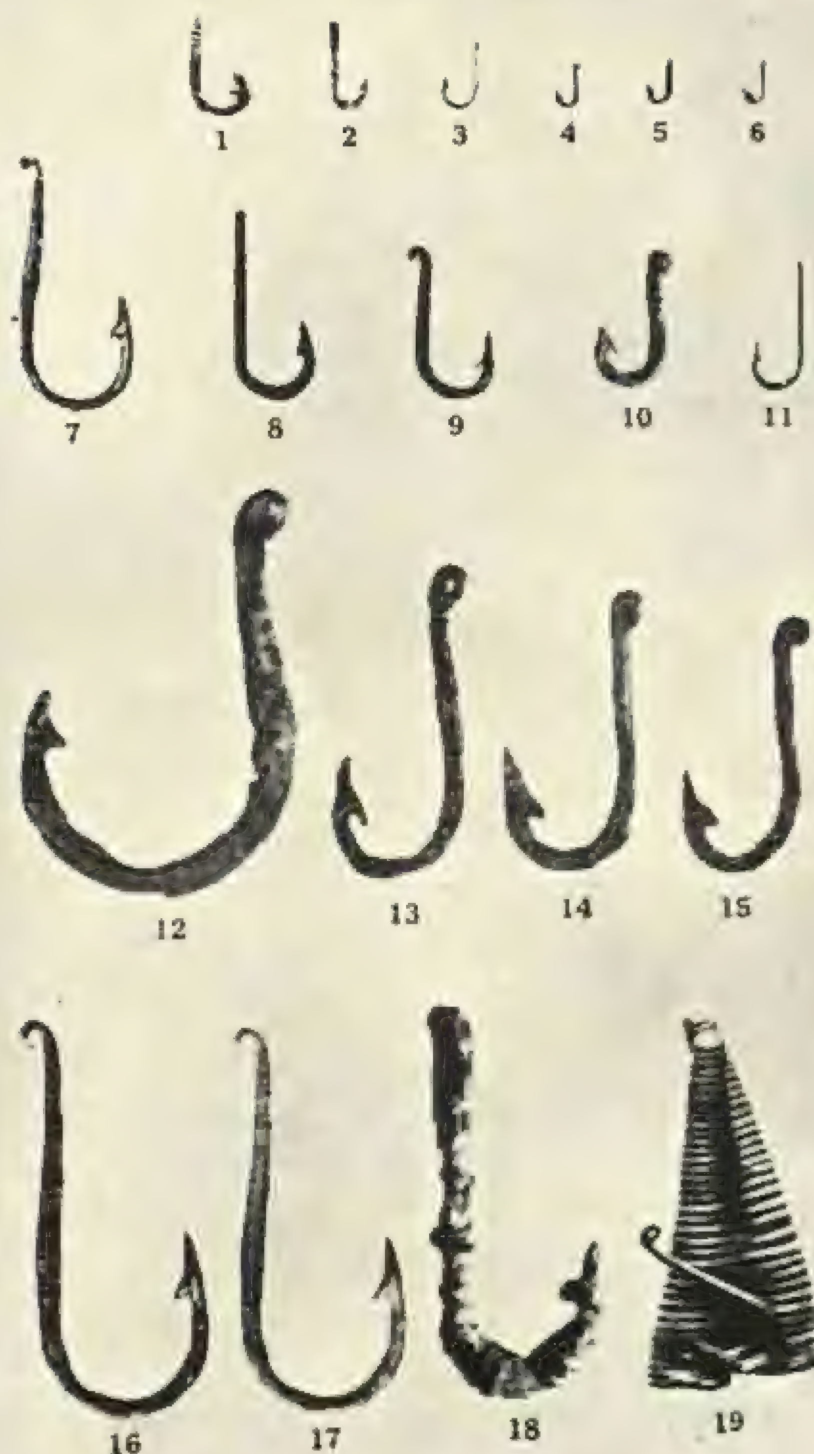
After a lapse of nearly three thousand years after the Harappā culture, we come across in the early part of the twelfth century the earliest text known on angling, by the Chāḷukya king Someśvara, included in his encyclopaedic work *Mānasollāsa* written in A.D. 1127 (Hora, 1951*a* and *b*). Someśvara's kingdom comprised the Godāvarī and Krishnā watersheds and extended to both the western and eastern coasts of India.

The *Mānasollāsa* is divided into five sections called *prakaraṇas*. The first deals with religious ethics, the second with polity, the third with architecture, painting, iconography, etc., and the fourth and the fifth with various kinds of amusements and recreations along with incidental references to arithmetic, astrology, preparation of calendars, training of horses and elephants, mining, alchemy, etc. In the section on amusements there is a chapter entitled *Matsyavinoda* ('Pastime of Fishing'), which shows how a king can derive pleasure out of angling. As many as thirtyseven species of Indian sporting fish are mentioned, and they are divided into marine, fresh-water and anadromous kinds. They are then further grouped into scaly and scaleless varieties, and each group is still further divided into large, medium and small, according to size. From the etymological meanings of the fish-names and other particulars given in the work about each kind, it has been possible to determine with a fair degree of certainty thirtythree out of thirtyseven species. The fishing tackle is dealt with under three main components, viz. line, rod and hook. Various types of fibres for making a line are suggested and their relative merits discussed. A solid bamboo-shoot or a branch of a mangroove tree is suggested as a suitable material for making a rod; and types of suitable iron hooks are described. For different groups of fish different prescriptions are given for preparing ground-baits, and methods of feeding various species are separately described. Someśvara also gives hints on the actual fishing technique and refers to details of ground-bait, tackle, float, bait, casting the line, fish-bite, striking a fish and playing a fish.

It will thus be seen that in the twelfth century the art of angling was developed in peninsular India to a very high standard, for the methods described by Someśvara are quite in line with those used by anglers in India to-day. It seems rather astonishing that suddenly in the twelfth century we find a work in which the art and practice of angling are so fully and elaborately described. This perplexing riddle can be easily solved if one studies the inscriptions of the old irrigation-tanks in peninsular India (Hora, 1951). The evolutionary sequence of angling in southern India would seem to be as follows.

There are inscriptions of the fifth and sixth centuries A.D., showing that irrigation-tanks were maintained from the revenue derived from paddy-cultivation. In an inscription of the middle of the tenth century there is a mention, for the first time, of a fisherman, but he is assigned the work of supplying wood for the repairs of boats used for the desilting of tanks and is paid for his labour in paddy. A Tamil inscription of A.D. 1112 mentions the revenue derived from fishing for the maintenance of a tank, thus showing that the art of pond-culture and angling had already progressed fairly far when Someśvara composed his *Mānasollāsa*. In the inscriptions from the thirteenth to the sixteenth centuries one finds that fishery-revenue from irrigation-tanks was sufficient for their maintenance. From this historical narrative the revival of the art of sport-fishing can be assigned to the middle of the tenth century so far as southern India is concerned.

[1] It may be noted, however, that the word *baḍiśa*, 'fish-hook', is common in Sanskrit literature, including the *Mahābhārata*.



Fish-hooks from Mohenjo-daro: 1-6, 8, 9, 11, 18 and 19, after Mackay; 7, 16 and 17, after Marshall; and 10 and 12-15, after Sarkar (see page 153).

It may be worth while to recall here that constructing ponds on farms in the U.S.A. and stocking them with suitable varieties of game-fish have very greatly stimulated angling in recent years. A parallel development in ancient India is thus easy to comprehend. This shows once again that the art of angling probably originated and flourished in the neighbourhood of impounded waters, natural or artificial.

3. ANGLING AMONG THE GIPSIES OF EUROPE

The gipsies of Europe, who, as is well-known, use Mongolian, Hindi and other fragments of Asiatic languages, mount the line on the rod as shown by Mr. F. R. Goldschmidt in the accompanying sketch[1] (fig. 1). The practice described in the *Matsyavinoda*, when properly interpreted, would seem to be entirely identical with what has been attributed to them. The question where the gipsies of Europe originally came from is still an unsolved problem. Their language and method of angling seem to lend some support to the hypothesis of their earlier wanderings over India, resulting in the continuity of certain culture-traits.

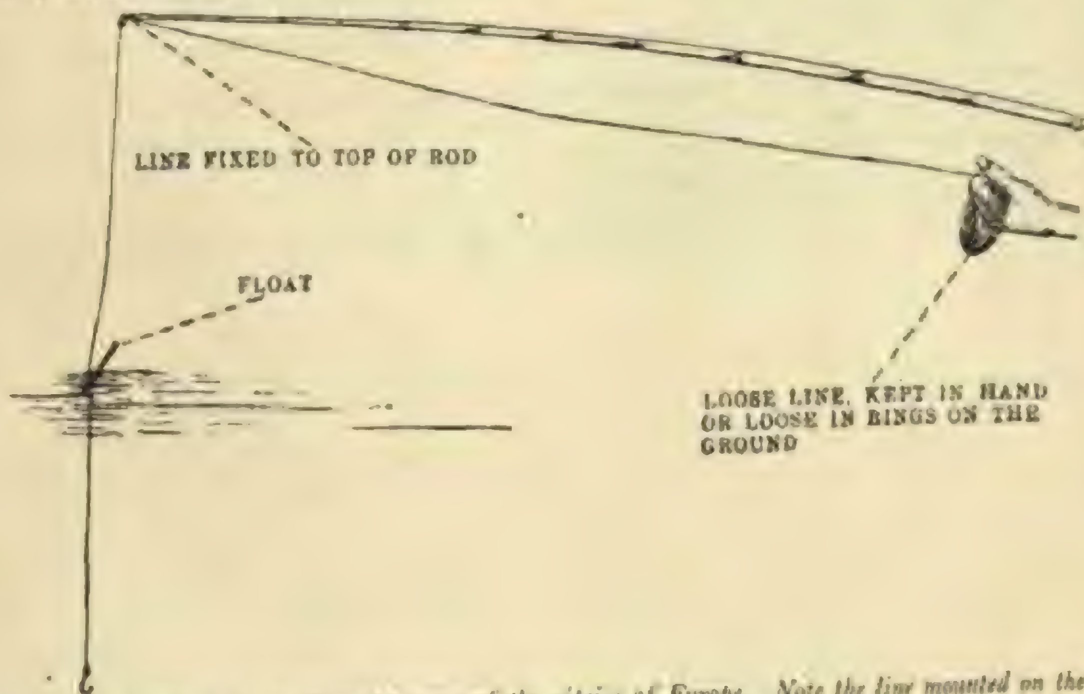


Fig. 1. *A sketch of the angling apparatus of the gipsies of Europe. Note the line mounted on the rod*

4. CONCLUSIONS

The main conclusions that can be drawn from the above account of angling in ancient India are:—

1. The art and practice of angling seems to have attained a high degree of perfection during the Harappā period, though the use of a rod is not indicated by the excavated material.

[1] Supplied by Mr. Goldschmidt, to whom my thanks are due.

2. The origin and development of the art of angling can be more closely associated with fishing from inland, particularly impounded, waters.

3. In the historical period the art and practice of angling declined in India.

4. With the construction of a large number of irrigation-reservoirs in peninsular India during the fifth to the sixteenth centuries, the art of angling was revived, and the earliest work known on the subject was written in A.D. 1127, making a mention of almost all the modern practices.

5. The gipsies of Europe practise angling in the way it is described in Someśvara's *Mānasollāsa*, and this lends additional support to the theory that they may have migrated to Europe from India.

REFERENCES

1. Hora, S. L., 1951, 'Maintenance of irrigation-tanks through fishery-revenue in ancient India', *Jour. Asiatic Soc., Letters*, XVII, pp. 41-50.

2. Do., 1951*a*, 'Knowledge of the ancient Hindus concerning fish and fisheries of India, 3, *Matsyavinoda* or a chapter on angling in the *Mānasollāsa* by King Someśvara (1127 A.D.)', *Jour. Asiatic Soc., Letters*, XVII, pp. 145-69.

3. Do., 1951*b*, 'A Sanskrit work on angling in the early twelfth century', *Nature*, CLXVII, p. 778.

4. Do., 1952, 'Fish in the *Rāmāyaṇa*', *Jour. Asiatic Soc., Letters*, XVIII, pp. 63-69.

5. Mackay, E., 1930, 'Painted pottery in modern Sind: a survival of an ancient industry', *Jour. Royal Anthropological Ins.*, LX, pp. 127-35.

6. Majumdar, N. G., 1934, *Explorations in Sind*, Mem. Arch. Surv. Ind., no. 48.

7. Marshall, J., 1931, *Mohenjo-daro and Indus Civilization*, 3 vols. (London).

8. Sarkar, H., 1953, 'Fish-hooks from the Indus valley', *Jour. Asiatic Soc., Science*, XIX, pp. 133-39.

THE POTTERY INDUSTRIES OF THE INDO-IRANIAN BORDER: A RE-STATEMENT AND TENTATIVE CHRONOLOGY

By D. H. Gordon

The difficulty of establishing a sound sequence of the early ceramic industries of Baluchistan and Sind, to a large extent due to the absence of reliable stratigraphic data, has been experienced by all workers in the line. Everybody will agree that 'further and intensive attacks on the problems of the Indian Dark Age' are called for, and in their absence whatever is written on the subject must be tentative. In spite of this obvious limitation, the present article of Colonel Gordon is a welcome addition to the existing literature on the subject. He has, with a view to completing the picture, touched upon some problems also dealt with in the preceding article on Hastināpura, viz., the dates of the Painted Grey Ware and the Northern Black Polished Ware (below, p. 175). The views expressed by the two authors are at variance; but while it is certain that neither can claim finality at the present moment, the fresh facts about both the Wares derived out of recent explorations (cf. above, pp. 22-23 and 51) have to be taken into account before any conclusion, however tentative, is drawn. Colonel Gordon also refers to Rangpur and bases his deductions on the previous excavation at the place (below p. 171). It is hoped that the renewed excavation, now in progress, will contribute towards clearing the issue.

CONTENTS

1. INTRODUCTION

It is often reiterated that there has been so much undigested excavation and reconnaissance that there should be a pause while we study the material that we have, before we burden ourselves with yet more. This may be true as regards some regions, but in Pakistan, Afghanistan and south-eastern Iran it can be shown that we know just enough to allow us to state the problems and, in the broadest terms only, put forward a framework of absolute chronology. It can also be shown that no very clear cultural movements can


Zhob Sites ●
Nal Sites ⊙
Amri Sites ▪
Kulli Sites ▽
Togau Sites +
Harappa & Bampur Sites ×
Kulli Sites with Nal Sherds
Nal Sites with Kulli Sherds
Site with Togau Sherds ⊕
Scale of Miles
50 0 50 100 150
60
64
68
72
32
30
28
TOCHI
KURRAM
GOMAL
MOGHAL GHUNDAI
PERIANO GHUNDAI
ZHOB
KANDAHAR
R. RAVI
HARAPPA
SISTAN
R. HELMUND
TWIN MOUNDS
SUR JANGAL
RANA GHUNDAI
DUKI
QUETTA
LORA
LAI
DABAR KOT
KECHI BEG
SAIYID MAUREZ
TOGAU
TOJI
R. INDUS
KHIRTHAR RANGE
ZAYAK
TAGHAZI DAMB
NAL
CHIMRI
BADRANG DAMB
KARGUSHKI DAMB
KHOZDAR
KALATUK
MEHI
NOKJO SHAHDINZAI
MOHENJO-DARO
DAMIN
KATUKAN
CHAH HUSAINI
BAMPUR
KHURAB
PERSIAN MAKRAN
GAR
PANDI WAHI
GHAZI SHAH
GATE
AWARAN
NUNDARA
KULLI
TIKRI DAMB
DAMB BUTHI
SHAHI
DAP
TUMP
PAK
ZIK
SIAH DAMB OF JHAU
AMRI
NAZARABAD
THALE DAMB
KOTHRAS
SUTKAGEN DOR
OTHMANJO BUTHI
Fig. 1

be traced except over limited areas; but that a close study of such evidence as we have enables us to produce a coherent picture of the succession and spread of these cultures and industries throughout Sind and Baluchistan, at the same time taking into account the approach routes through Sīstān and Persian Makrān.

The plan of this paper is to discuss briefly the source of these painted pottery industries, to present a fresh appreciation of the evidence of the main type-sites and then work out step by step, with a commentary on the available evidence, a chronological chart based on three fixed points—the arrival of the potters who made wheel-thrown painted pottery, the start of the Indus civilization and the start of the Period of Invasions. While it is most undesirable to be always changing the names given to various pottery industries, I have in the instance of Loralai and Periāno stuck to the original terms given in my article in *Man in India* (Gordon, 1947), the former including the group of related sites Rānā Ghundai, Sūr Jangal, Moghal Kila etc. round Loralai and the latter the very individual industries of Periāno Ghundai and Moghul Ghundai. I prefer to keep Amrī separate from Nāl-Nūndara and to refer to the Kulli culture with the understanding that this infers Kulli-Mehī. I have retained the original names given by Piggott to the Quetta sites, as no one seems very happy about the spelling of Damb Sadaat, and that of Kile Gul Muhammad is definitely mis-spelled by Fairservis. In the final section an attempt is made to give a clear factual statement about the theory of Red and Buff Ware cultures and their areas and also to indicate the problems which might well be solved if excavations were carried out at the right places.

2. THE SOURCE OF THE PAINTED POTTERY INDUSTRIES

Early in the cultural sequence of Baluchistan we have evidence of the local primitive hand-made wares being superseded by wheel-thrown painted pottery, and while it is not impossible that this style of pottery evolved locally, some of those hand-made wares having themselves been painted, such an occurrence does not appear likely. Wheel-thrown painted pottery of what is known as Amrī type appears to the east of the Baluchistan area as the earliest ware of the earliest known peasant cultures in Sind, which were basically neolithic in type, earlier known cultural remains preceding these peasant communities being those of a hunting, food-gathering people.

It is reasonable to suppose, therefore, that the wheel-thrown painted pottery came from the west, where there had been, both in Iraq and Iran, an evolving painted pottery tradition of great antiquity. In Sīstān, the region round the Helmund Lake, there is evidence of peasant communities using painted pottery with decoration typical of that common at sites on the plateau of Iran at the end of the fourth millennium. It seems probable that these peasant potters made their way into Baluchistan *via* the Kandahār plain, though the rather hasty reconnaissances of Fairservis in this area have only shown types connected with the Quetta sites of Miān Ghundai and Ahmad Khanzai, which, in the case of the site Said Kālā, were stratified above a level containing mat- and cord-marked hand-made ware, which may well link with similar pottery from Quetta and Baluch Makrān. With this hand-made ware, sherds of imported pots, rather vaguely described as 'Quetta or Zhob trade wares', were found; so no clear picture of a movement of wheel-made pottery of a proto-Amrī type from Sīstān to Baluchistan *via* the Kandahār plain can yet be demonstrated (Fairservis, 1952, pp. 22-24).

There is only one other natural line of approach, namely the valley sequence of the Halil Rud and Bāmpur rivers and the Kej, Kolwa and Mashkai valleys which connect the Iranian plateau, through Persian and Baluch Makrān, with India; and it is here that we find a succession of ancient sites revealed by the reconnaissances of Sir Aurel Stein,

producing a great wealth of painted sherds, which, after much investigation, still present us with a number of problems. In all these wares the original influence of Iranian painted pottery is, however, quite definite; for it can be seen that the simple Amrī patterns, the ibex and sigma patterns of Kulli and Mehī and the animal zones of Loralai II are all referable to Iran and some of the more complex patterns of Quetta specifically to Bakun 'A'.

Let us then examine in turn the wares of Amrī, of Nāl and Nūndara and of Kulli and Mehi, and also Togau ware and the early wheel-thrown pots of Loralai II and III and see whether a still clearer picture of their inter-relationship than we now have may be possible, and whether we can establish a basis for a sequence of chronology, which we can expand as we examine in turn yet other wares and cultural products of this region which is now mainly within the boundaries of West Pakistan.

A. Amrī, Nundara and Nāl

The term Amrī-Nāl to denote a particular culture or even a pottery industry is not a very happy one. To examine in the first place the type-name of Amrī: this was applied originally to a group of ceramic industries in Sind which were found to underlie the pottery of the Harappā culture wherever they occurred together. While displaying local peculiarities, all these wares could be grouped as belonging to one contemporary culture of peasant farming communities. To be associated with the Amrī culture is a type of pottery called by Fairservis 'Kechi Beg', which is found on Quetta sites stratified above early hand-made wares and below the Quetta ware, and yet another ceramic industry conforming to this type is that of Loralai III in the Zhob. These industries are characterized by a bichrome use of black and bright red on varying backgrounds of red, buff and brown of many shades and by pot-forms consisting chiefly of bowls, globular pots and straight-sided beakers.

The patterns, while showing a considerable range in detail, present an unmistakable similarity of general appearance. Those of Amrī, the type-site, namely bands of sigmas, continuous lozenges and chevrons and chequer-board panels, are the connecting link with Nūndara ware. Apart from this definite Amrī-Early Nāl and Nūndara contact, the only definite parallels that can be shown between the wares of Makrān and of the Amrī culture in Sind are sherds with 'ladder patterns' from Gate Dap (Stein, 1931, pl. XX, G.D. 4 and 8), which are almost identical with sherds from Pāndi Wāhi and Kothrās (Majumdar, 1934, pls. 28, 1 and 29, 31 and 35) and another sherd (G.D. 1) from the same site similar to some from Ghāzī Shāh and Othmanjo Buthi. From Tikrī Damb also there is a sherd with a complicated pattern (Stein, 1931, pl. XXIV, Tik N. 5), which is almost an exact duplicate of one from Pāndi Wāhi (Majumdar, 1934, pls. 29, 37); there are, however, fewer Amrī type sherds in Makrān than one would anticipate (fig. 6, 8, 9 and 12-17).[1]

Let us now consider the Nāl-Nūndara culture. Having acknowledged the debt of Early Nūndara to Amrī, it will be as well to realize that such Amrī influences as one has noticed in Nūndara ware are almost wholly absent from the pottery of the Nāl cemetery. Our knowledge of this culture is far less securely based than many might believe. Wares allied to Nāl-Nūndara are spread over the whole of southern Baluchistan, but those having patterns of the best style as found on the many pots recovered from the cemetery dug into the Sohr Damb of Nāl are quite scarce. Kargushkī Damb in Rakhshān and Ashāl, Zik, Hor-Kalāt and Pak in Kolwa have both Nāl and Nūndara wares, and there are exceptional

[1] For pottery illustrations, figs. 6-10, see below, pp. 183-190.

sherds of Nāl ware, probably strays from further south, at Suneri Damb in the upper Mashkai and Chimri, Khozdār (Stein, 1931).

Not much is known about the Siāh Damb of Nūndara. Stein cleared a number of rooms of ruined buildings of which the outlines were visible on the surface but did not dig a trial-section; he was, however, convinced that Nūndara ware and a more simple black-on-red ware (Togau) were produced concurrently and, having regard to the fact that only Nūndara ware appeared in the deep rain-cut ravines, that the production of this ware covered a long period.

Though the work of Stein at Nūndara was in the nature of a hurried reconnaissance, that of Hargreaves at the Sohr Damb of Nāl purported to be a regular excavation. Actually it was not particularly regular nor very extensive, and the results do not give us the amount of information sometimes suggested; in fact, few sites would appear to have given more misleading impressions than the Sohr Damb of Nāl. For instance, when Gordon Childe says, 'the ruins of elaborate stone and mud-brick buildings cover an area of 30,000 square yards,' he is only drawing a reasonable inference and not speaking of any ascertained fact (Childe, 1952, p. 202), and Piggott seems to confuse the settlement into the débris of which the Nāl graves were dug with the Periāno III settlement at the summit of the mound (Piggott, 1950, p. 80).

What are the facts as regards the site of Nāl? A small excavation in a triangular area of about 300 sq. ft. at one end of this mound disclosed a cemetery with a characteristic ware, since known as Nāl pottery. This cemetery was dug into the ruins of a settlement, and all the excavated burials lay above the floor-level of these houses which appeared to have been on natural soil. The excavator was concerned only with recovering whole pots and other intact cultural objects, such as beads, seals and metal tools; broken pot-sherds do not appear to have been collected to any extent at all. The few sherds that were collected (Hargreaves, 1925, pl. XXI), where they are not directly connected with the burials, have a *pipal*-leaf decoration of the Kulli type; and the decoration of a complete pot (fig. 6, 2) found in the small area F, about 8 ft. square and half-way up the mound, is similar to a sherd published without context (Hargreaves, 1925, pl. XXI, 15) and of a type found only at Kulli (Stein, 1931, pl. XXI, Kul, 1.v.1) and at Pāṇḍi Wāhi (Deva and McCown, 1949, pl. VII, 74), which has many Kulli contacts (fig. 6, 1-7). With the discovery of twenty bull figurines, which in this area, are to be associated only with the Kulli culture, there is little doubt that the Sohr Damb of Nāl is a Kulli settlement site with a Nāl cemetery.

If this is really the case, the situation poses a problem of far-reaching importance, namely, at what period the Nāl culture people used the mound as a burying ground, presuming that they did not themselves occupy any part of it—and there is no evidence that they did—and that the mound was unoccupied when they came from some adjacent but unknown settlement to bury their dead on the Sohr Damb. The implications of this will be examined later when working out the tentative chronology. At the highest point of the mound a series of four rooms was unearthed, but apart from the fact that the pottery discovered was that of Periāno III and that the settlement was without doubt burnt down, we have no additional information.

The extent of our knowledge then about the Nāl-Nūndara culture is that although Nūndara ware shows some contact with Amri at an early stage, this culture shows increasingly a greater tendency than that of Kulli-Mehī to evolve in semi-isolation. At Kargushki Damb, as is emphasized by Piggott (1950, pp. 76-77), the Nāl occupation overlay 30 ft. of unexcavated material which may well have been the product of some other culture. The most evolved Nāl ware, such as is found at the cemetery at the Sohr Damb, has the indications of being, relatively speaking, late rather than early; a point

which will be discussed in more detail when we deal with the chronology. The Nāl type sherds found by Majumdar in his last expedition to the Khirthār foothills in 1938 seem to be poor copies of Nāl motifs, late in date, and very unlikely, as suggested by Deva and McCown, to be pre-Harappan. On the other hand, the sherds found at sites nearer the Indus, which are of a simple Nūndara type, are certainly much earlier. From the evidence available we can only note the actuality of the Amri-Early Nāl and Nūndara contact as an important fact and be tolerably certain that this culture evolved gradually over a period of some hundreds of years and was influenced, particularly in its later stages, by some form of contact, as yet obscure, with one of the higher centres of civilization other than that of the Indus valley.

B. Kulli and Mehī

As a result possibly of more extensive excavations by Stein, the sites of Kulli and Mehī have provided evidence of a definite culture as opposed to the distinctive ceramic industries which characterize the bulk of the available material. The stage of technical attainment in metalwork, the presence of 'goddess' and bull figurines and the *pīpal*-tree motif on the pottery—all provoke a comparison with the civilization of Harappā and Mohenjo-daro, which has been most ably dealt with by Stuart Piggott (1950, pp. 96-118).

As regards cultural sequence or development, Stein's excavation at Kullī tells us very little; rooms were cleared and a trench dug to give a general section of one slope of the mound, but no stratification or even relative depths of finds was recorded. In room i. vii, a level of flooring consisting of a thick layer of small stones was found, but no attempt was made to recover or record the material sealed by this floor. One thing, however, is quite clear, namely that nothing that has been published as coming from this site, with the exception of two sherds, both surface-finds, is of a style that cannot be readily recognized as belonging to the Kulli culture. These two sherds are Kul. 8 (Stein, 1931, pl. XXII), which closely resembles late coarse wares from the Zhob, and Kul. 1, which is like a sherd from Badrang Damb (Stein, 1931, pl. II, B.R. 10), both of which have the appearance of Londo ware.

From the vast mound of Mehī we have derived no evidence of stratification. Two fragments of Nūndara ware (Stein, 1931, pl. XXVII, Mehī 15 and 16) were found on the surface, and there is a simplified form of Kulli-Mehī decoration which may be late (Stein, 1931, Kul. i. vii. 5, Mehī II, 8·2 and III, 2·6). It is of interest also that the decoration of sherd Mehī 9 closely resembles one from Moghul Ghundai in the Zhob (Stein, 1929, pl. XI, MM.N. 9). It is the Mehī form of this culture that shows the closer resemblance to Harappā in its use of *pīpal*-leaf motifs, its 'goddess' figurines and the high standard of its metalwork; particularly, as is pointed out by Piggott, a bronze mirror, which, in its conception of the reflected face showing as the head of the figure forming the handle, was far in advance of Harappan work.

A most interesting sherd (Deva and McCown, 1949, pl. VI, 70) of the late period at Mohenjo-daro seems to have been decorated by a Mehī pot-painter. As these authors have pointed out, the peculiar fringed feet can be paralled by those on a Kulli sherd from Bazdad Kalāt and the tree under the animal's belly by an example from Mehī; they also publish a typical Kulli sherd from the site of Naig in Sind (Deva and McCown, 1949, pl. VII, 76).

It is plain, therefore, that the Kulli culture was of considerable duration, that it had contacts with the Harappā culture as shown by its pottery motifs, figurines and standard of metal tools and utensils and that it had a wide sphere of influence from Bāmpur in Persian Makrān to Ghāzī Shāh in Sind. Our present knowledge gives the impression

that, like the Harappā civilization, the culture of Kulli appears more suddenly than that of Nūndara with its Amrī-Kechi Beg background and seems to have its strange east-west mixture of bulls and ibex, *pīpal*-trees, sigmas and comb patterns from start to finish.

In spite of the fact that we are indebted to the amazing pertinacity of Sir Aurel Stein for practically the whole of our archaeological knowledge of this region, his reports give us little or no evidence of stratigraphic sequence which might help us to determine the chronological order of the potsherds he gathered up so abundantly. It is fortunate, however, that more helpful indications are available from the work of Brigadier E. J. Ross at Rānā Ghundai and W. A. Fairservis at sites round Quetta, the former establishing a long series of occupations which gives the key to the sequence of the majority of the pottery types of the Zhob and the latter discovering by his excavations at Miān Ghundai that the Quetta ware, first brought to notice by Stuart Piggott, was preceded by a pottery industry of Amrī type which he calls Kechi Beg after a site where this type of pottery appears as a single culture (Fairservis, 1952, pp. 10-18). Another very important pottery industry was identified by Miss B. de Cardi and named by her as Togau ware (fig. 7, 1-6). This was shown by her field reconnaissances to be widespread with its centre in the country round the present town of Kalāt and to extend west to Gar in Rakhshān, north to sites round Quetta and east to the Indus valley. This is a red ware with decorations of animals and humans and particularly zones of hook patterns, also single black bulls' eyes in panels and wavy bands joined above and below to straight bands by groups of vertical lines (de Cardi, 1950).

It is the fact that Togau ware can be linked stratigraphically both with Kechi Beg and Amrī, and that Amrī can similarly be linked both with the Harappā civilization and Early Nāl Nūndara, with which latter it has also stylistic affinities, which enables us to make certain fundamental equations on which a tentative chronology may be based.

3. TENTATIVE CHRONOLOGICAL FRAMEWORK

It may be considered somewhat premature for any one to attempt a chronology of even a section of Indian prehistory, but unless a presentation is made of what we know and of the legitimate deductions which stem from that knowledge, it will be impossible even to appreciate the problems involved, let alone such facts and speculations as may afford a reasonable basis for a tentative interpretation.

The chronological premise on which this attempt is based is that which has recently been published by Sir Mortimer Wheeler in the following words: 'It will suffice to premise that the Indus civilization was in full flower in the time of Sargon of Agade and that the period 2500 B.C.-1500 B.C. has been estimated as likely to have comprised the material available, without prejudice to such further evidence as may eventually be forthcoming from the unplumbed depths of Mohenjo-daro or Chanhu-daro' (Wheeler, 1953, p. 4).[1]

The equations of sites in Sind are as follows:—

Pāndi Wāhi.—Togau ware at +0·5 to −3·2 ft. equals the earliest appearance of Nāl sherds at that site and is at the same level as the earlier Amrī ones which continue to +3·2 ft.

[1] The reasons supporting this dating are set out at length by Sir Mortimer Wheeler on pp. 84-93, and nothing said by Stuart Piggott on pages 207-210 and 238-240 of *Prehistoric India* suggests any material divergence of opinion. This dating was urged by the present writer and Mrs. Gordon in 1940 (Gordon, D. H. and M. E., 1940, pp. 11 and 12), and as Wheeler says, 'A provisional dating of 2500-1500 B.C. for the Indus civilization responds consistently to the current tests'.

GHĀZI SHĀH.—Togau comes about midway in the Amrī sequence and Nāl possibly towards the end.

DAMB BUTHI.—Togau and Nāl sherds are present in the general Amrī assemblage.

AMRI.—A Togau sherd was found in Trench II along with typical Amrī ware (Majumdar, 1934). Fairservis found Togau ware at three sites near Quetta in a late Kechi Beg setting (Fairservis, 1952, pp. 33 and 34).

We can, therefore, say that Togau equals Early Nāl-Nūndara and Amrī contacts in south Baluchistan and Makrān, Late Kechi Beg round Quetta and Middle Amrī and Early Nāl in Sind; and if we observe that Early Nāl just overlaps earliest Harappā at Pāndi Wāhi but Togau probably does not, this fixes these important contacts with reference to an approximate dating of 2600 B.C. Now, the bichrome beakers of the sites round Loralai in the Zhob (Rānā Ghundai, Sūr Jangal, etc.) can be classed as closely akin to Amrī, Kechi Beg and Early Nāl-Nūndara, and as this phase has two preceding periods characterized by totally different wares I shall call it Loralai III. We can now line up industries as follows:—

SOUTH BALUCHISTAN AND MAKRĀN		QUETTA		SIND		ZHOB
Amri-Early Nāl and Nūndara contacts	Togau	Kechi Beg	Togau	Nāl and Amrī	Harappā Togau	Loralai III

If we suppose, as I think we must, that Kechi Beg ware is derived from Iran *via* Sīstān or Makrān, probably the former, then this type of pottery will have spread from the Quetta area to the Zhob and Sind, and Amrī and Loralai III will be of a somewhat later in date. The bichrome technique spread to Periāno Ghundai and Moghul Ghundai and can be classified there as Periāno I (Stein, 1929, pl. VI, p. 62) but has so far not been traced to Dabar Koṭ, where the initial occupation seems to have been that of Periāno II. Periāno II is an industry examples of which spread to most of the Zhob sites, an intact specimen being a jar from Sūr Jangal (Stein, 1929, pl. XX, S. J. i. c.). The vertical wavy lines which are characteristic of this ware are present in sherds from Periāno Ghundai and Moghul Ghundai, where it is most definitely at home (Stein, 1929, p. 65; pls. VI and XI, MM.N. 6). It spread to Panjab and has been traced by sherds in the make-up of the Harappā rampart (Wheeler, 1947, pls. XLI, 6 and XLII, 9 and 10); whether these were imports is uncertain, but there seems at any rate to have been a peasant community contemporary with Periāno II occupying the site before the foundation of the city.

The start of Loralai IV, in which the bull figures on the pottery, which had persisted from Loralai II, become very elongated and eventually conventionalized out of recognition (fig. 8, 7-10), probably comes soon after the period of Togau ware, the deer-head friezes of Sūr Jangal (Stein, 1929, pls. XX, S. J. vi. 9 and XXI, S.J. 12) appearing to owe something to the ibex heads of Sayid Maurez and Chimrī, Khozdār, (Stein, 1931, pl. XXXIII, Maur 2 and Chim 2); but bichrome patterns died out and decoration throughout the Zhob was increasingly influenced by that of Periāno II. The shoulder-flanges on the small globular pots on a low pedestal, which had obtained in the bichrome of Loralai III, increased in size, and this style of pot probably persisted even after the general take-over of Periāno III on all the Zhob sites (fig. 7, 9). If we observe, ahead of

our narrative, that Kechi Beg was followed by the phase Quetta A, we now have a good solid foundation on which to build:—

South Baluchistan and Makran		Quetta		Sind			Zhob
Amri-Early Nāl and Nūndara contacts	Togau	Quetta A		Late Amri-Nāl and Amri	Harappā	Loralai IV	Periāno II
		Kechi Beg	Togau		Togau	Loralai III	Periāno I

What is our next potential fixed point? This must be the Period of Invasions which brought the peasant cultures of Baluchistan to an end and finally swept away the Indus civilization. The Period of Invasions, which includes the disintegration of the Harappā culture, can be put roughly from 1800 to 1400 B.C. In the meantime we see the probably rapid spread of a people whom we will call those of Periāno III. Like that of Periāno II, the pottery industry to be associated with this people appears to originate in the Fort Sandeman area at Periāno Ghunḍai and Moghul Ghunḍai, and pottery of this type as found in the vicinity of the first mud-brick structures at Rānā Ghunḍai marks their spread westward to the Loralai area where they take over on all the sites (fig. 7, 7-11). At Dabar Kot, where a Harappan outpost must have been established shortly after the foundation of Harappā city, there is little trace of them. These people, however, continued their westward spread, and a settlement is found at Kile Gul Muhammad near Quetta and another south again at the Sohr Damb of Nāl, and traces, carried more probably by trade, reached Nazarābād still further west in Makrān (fig. 6, 10 and 11). It was this culture that was dominant in north and central Baluchistan when the first Aryan-led invaders swept in from Iran.

On the sites in the Quetta area, excavations by Fairservis distinguished the successive industries of Quetta A and B and Sadaat ware, and these must occupy the period from *circa* 2600, when Kechi Beg and Togau come to an end, to *circa* 2100, when the figurines and pottery of Periāno III appear.[1] Though, as has been pointed out by Piggott (1947, Appendix), many of the Quetta motifs appear at Bakun and other Fars sites, if one compares a number of Quetta sherds having the more elaborate 'block-drawn designs' which are placed by Fairservis in his Late Quetta (B) with typical Bakun type sherds from Tal-i-Pir, Haraj, (Stein, 1937, pls. XXVIII and XXIX), no true resemblance as a ceramic group will be found to exist. It is, however, as well to bear in mind that the elements noticeable in Quetta ware such as bands with jagged edges and series of fine-lined zigzags appear at Tal-i-Iblis near Kerman, Nūrābād and Tump-i-Surkh in Rudbar, Chāh Husaini near Bāmpur and Nazarābād in the Nihing valley, all of which sites are obviously influenced by those of Fars. It would appear, therefore, from the fact that Quetta motifs are substantially unrecorded from Sīstān, that these have their origin in south-east Iran and were introduced possibly through Rakhshān, though at the moment there is no evidence at all to show by what route they travelled.

[1] The exact status of the industry 'Sadaat ware' and any cultural change that may have come with it is still somewhat obscure, but northern influences are clear, and the sherds P. 43 and P. SW. 12 (Stein, 1929, pls. V and VIII) from Periāno Ghundai have the same appearance as Sadaat ware and the goddess figurines in Sadaat levels are the same as some from the Zhob (Fairservis, 1952, fig. 3, A; Piggott, 1950, fig. 16, top centre).

Now, if we put the Periāno III settlement at the Sohr Damb as starting about 2000 B.C., the Nāl-Nūndara culture, and parallel with it that of Kulli-Mehī, would have six hundred years of comparative stagnation, as evidenced by the pottery unearthed by Stein at Kulli and Nūndara, with only occasional contacts with the equally static cultures of the Indus valley. There are, however, some chronological pointers. At Ghāzī Shāh in Sind, bulls and arrow-headed trees, strongly reminiscent of Kulli, overlap the last stage of Amrī at —32·3 ft. and, extending up to —25·7 ft., they also overlap the early Harappan type of spreading *pīpal*-trees at —28·8 ft. and the later more normal types at —27·2 ft., all of which bears out the impression of a long-lived Kulli tradition.

The designs on the pottery at the Nāl cemetery show a degree of assured competence that proclaims their probably late date. The polychrome use of red, blue and green paint is parallelled at Mohenjo-daro in the instance of a few small vases, which, however, tell us nothing as their findspots span the whole life of the site. The winged lion illustrated by Hargreaves (1925, pl. XXI, 8) and a winged monster with an animal's body and a broad-beaked bird's head[1] are both technically advanced, and though the winged-animal motif appears in Babylonia as early as Early Dynastic III, the impression made by this decoration is one of considerable sophistication.

We should now consider the problem posed by the presence of the Nāl cemetery at the Sohr Damb. It is inconceivable that the site was occupied by either the Kulli or Periāno III settlements when the burials were made; it is suggested, therefore, that the Kulli people had recently evacuated the site when, at about 2150 B.C., the burials started and that these ceased when the site was re-occupied by the people of Periāno III about a hundred and fifty years later. There seems to have been a withdrawal of Kulli people about this time, possibly towards the main type-sites, as it is probable that they had also left Shāhī Tump some fairly considerable time before the late cemetery was located there. Until 2000 B.C., from which time onwards conditions appear to have been increasingly disturbed, it seems likely that there was a chalcolithic continuum throughout this area with a peaceful live-and-let-live policy between the peoples of the Baluch hill settlements and those of the Indus plains.

Can we pin down the chronology of the Kulli culture any closer? What are its connexions with the Bāmpur-Khurab complex further west? The communities which occupied the Bāmpur oasis and up the Bāmpur river to Damin present us with a chronological problem similar to the one we shall meet again when we encounter the cairn-burial people of Makrān and Baluchistan, some indications pointing to an early date and others to a much later one. The painted pottery of the Bāmpur region with its zones of ibex, fringed palm-trees and undulating bands has a strong feeling of Kulli about it; on the other hand, the shallow bowls with their *swastika*-like patterns and horn-fringes remind one strongly of the Shāhī Tump cemetery bowls of similar style. The bird-forms which are so common on the bowls of Khurab and Damin are not found at Shāhī Tump, and the horn fringes derive ultimately, but less remotely than in the case of Shāhī Tump, from Tal-i-Bakun.

The most important chronological objects from the Bāmpur area are the incised pots of greyish brown ware with mat-wall and door patterns. As regards the chronology and diffusion of this type, it is not possible to agree with the ideas put forward by Stuart Piggott (1950, pp. 110, 111, 116 and 117), which envisage these hut-jars as originating in Makrān whence they were exported containing a scented unguent. The position is as follows. In Iraq, widely distributed from Susa to Mari, hut-pots carved in stone with

[1] This is on a typical intact polychrome Nāl pot from Captain Martin's collection, now in the Institute of Archaeology, University of London.

a highly naturalistic representation of the matting walls and reed-bundle doorways and dating to the end of the Early Dynastic period have been found in some numbers. In the lowest levels of Mohenjo-daro a fragment of a pot exactly of this type, obviously an import, was found, and a date of *circa* 2500-2450 B.C. is a reasonable one. Another similar fragment mentioned by Piggott (1950, p. 116), now in the Central Asian Antiquities Museum, New Delhi, removed at some time from the Quetta Museum and found on the Dasht River probably by Major Mockler, in my opinion possibly at Sutkagen-dor, can only be used as evidence of this early contact between Iraq and the Indus valley.

The incised pots of Bāmpur are rough but recognizable copies of the Sumerian hut-pots, the form of decoration found at Adab of superimposed zones with doorways being copied exactly at Bāmpur (Stein, 1937, pl. VIII, A. 365), and the doorway is itself a common feature and the matting walls recognizable as such. At the Kulli culture sites, however, the hut has disappeared, there are no doorways and no recognizable mat-walls; here, in fact, we have only a very third-hand copy of the original naturalistic hut-pots. This is further borne out by the fact that an incised pot of Mehī type was found at Mohenjo-daro in an upper level, where its dating is unlikely to be earlier than 2000 B.C. (Marshall, 1931, II, p. 369, and III, pl. CXXXI, 36 and 37). One thing, however, this does indicate and that is, whereas we must date the Bāmpur specimens not later than 2300 B.C. at the very latest, the incised pots of Mehī could easily be as late as 2100. Another very important find from this area is the bronze[1] object having on it the figure of a squatting camel (pl. LXXVI). This, as was indicated by Stein in his original report, is an axe; in the photograph reproduced by Childe (1952, pl. XXIX, b) the shaft-hole is clearly visible. The implications of this axe will be studied when we come to deal with the Period of Invasions (below, p. 169).

4. THE EARLIEST PEASANT POTTERS

What is the background of these peasant cultures which we have just been considering? At Kile Gul Muhammad, 4 miles north west of Quetta, Fairservis unearthed a pre-pottery settlement which, although it had mud-walled huts, was in the same stage of cultural development as the hunting and food-gathering mesolithic peoples of India. Fairservis calls this settlement Kili I, and stratified above it was that of Kili II which had hand-made pottery, some of it with simple geometric painted designs and some with mat-markings (Fairservis, 1952, 17 and 18). It is probable that these can be equated with similar hand-made painted pots found by Ross at Rānā Ghuṇḍai (Loralai I) and the mat-marked sherds found by Stein at seven sites in south Baluchistan.

Early settlers or, at any rate, potters, had moved eastward from the Iranian plateau bringing with them the manufacture of painted wheel-thrown pottery, their presence being attested at sites in Sīstān (Stein, 1928; Andrews, 1925), Rudbar and Persian Makrān (Stein, 1937). Sīstān shares with Persian Makrān a number of patterns which derive from the west; fringed Maltese squares, the door pattern and the pattern of a triangular scalloped frame, though commonly found in both these areas, do not seem to have travelled further east (Gordon, 1947, p. 218 and fig. 1). It seems probable that the presence of these potters may be due to the break up of the painted pottery cultures of Iran between 3000 and 2800 B.C., when we see also a spread of typical Iranian painted pottery motifs to the south-west in the period Ninevite V.

[1] Stein, who found it, and the Curator of Asiatic Archaeology of the Peabody Museum, Harvard University, where it now is, both call this axe bronze.

The allied wares of Amri, Kechi Beg and Loralai III must have been introduced through these channels from Iran. There are, however, the buff-ware pots of Loralai II, found at Rānā Ghundai, Sūr Jangal and other sites immediately round Loralai, having a frieze of bulls or black-buck, and which precede the bichrome pots of Loralai III. This ware in its best period seems to have been short-lived, as witness the shallow 'bull' pottery layer at Rānā Ghundai, and of small distribution, limited to sites close round Loralai; one unrecognized sherd of this ware seems, however, to have made its way to Damb Buthi[1] in Sind (fig. 6, 18).

Though the affinities of Loralai II 'bull' ware are with Hissar Ic and Sialk III 4 to 6 and the idea of animals depicted as a decorative zone on pottery must derive from Iran, the pottery of Loralai II in its general appearance has little in common with that found either in Sīstān or Makrān, and the animals are remote from their natural habitat, which is the plains of India. The derivation of this particular mode of pot-painting is quite obscure.

Brigadier Ross has clearly pointed out that the Baluchistan plateau is not black-buck country, and it is difficult to understand how these animals came to be introduced when the urial must almost certainly have been at hand to provide the normal ibex motif. Though Ross has described this ware in great detail (Ross, 1946, pp. 300-304), it should be realized that by far the greater number of vessels of this 'Bull Period' were open bowls having their principal decoration on the inside, ranging from about 40 cms. to 26 cms. in diameter (fig. 8, 1-4). There is a great range also of pot fabrics from very fine to thick and coarse, but the sherds that I have examined are all pale-sectioned, a kind of pinkish buff, and their slip is buff, cream or greenish cream. Though the duration of the 'Bull Period' was short, modifications of the bowls and designs of Loralai II, with bulls becoming both more elongated and more stylized, continued on all sites down to the advent of Periāno III (fig. 8, 7-10). It is possible now to insert Loralai I and II and Kile Gul Muhammad I and II and to indicate the arrival of the settlers from Iran at about 2900 B.C. in round numbers.

5. THE PERIOD OF INVASIONS

Widespread destruction, argued for by the consistent appearance of ash-levels in the stratigraphic sequence at a number of sites at what would appear to be a contemporary stage of their cultural history, wiped out the painted pottery culture of Periāno III and any surviving communities of the Kulli and Nāl cultures.

If it were not for the cemetery dug into the débris of a Kulli settlement on Shāhī Tump mound, in the Kej valley of Baluch Makrān, we should have but little information about these invaders. Stuart Piggott's original research, which traced the connexions of the Shāhī Tump grave-goods with Hissar III, Anau III and Jhūkar (Piggott, 1943), indicates that *circa* 1800 B.C. is a reasonable date to start the Period of Invasions. The archaistic pottery of the Shāhī Tump cemetery seems to be so definitely produced for the purposes of burial and so unsuited for normal daily use, that there is some doubt as to what the everyday pots and jars of these people were like. What appears to be Shāhī Tump ware was found by Stein at Sar Parom, at Jai Damb also in Parom and at Nazarābād in the Nihing valley, but these sherds are few and small and give us very little information.

[1] This sherd (Majumdar, 1934, pl. XXIV, 29) should be turned clockwise through 90° when one can see the body, legs and tail of an animal having a vertical row of sigmas between the legs.

At this point one should consider also the burial at Khurab containing the axe with the figure on it on a squatting camel[1] (pl. LXXVI). This object, probably by reason of Stein's unsatisfactory photograph, has been spoken of as a wand, but Stein describes it as a 'curious bronze object resembling an axe-head surmounted by a seated camel', and an axe-head it most certainly is; a narrow bladed shaft-hole axe, 18·3 cm. long from the head of the camel to the edge of the blade with an oval shaft-hole 2·8 × 1·1 cm. (Stein, 1937, p. 121 and pl. XVIII; Childe, 1952, pl. XXIX b). No exact parallel can be traced in western Asia, but the closest is the axe from Til Barsib with a similar straight blade and confronted pairs of lions on the socket; there are also axes from Van and Luristan having a lion along the back of the socket, and all these seem to fall within the limits of 2100-1700 B.C. The oval shaft-hole of this axe would tend to date it towards the lower end of these limits. This axe from Khurab, though of a more sophisticated style, must, therefore, be roughly contemporary with that found at Shāhī Tump and is an argument for the burials also at both these sites being contemporary at a date shortly after 2000 B.C. as proposed by Piggott (1950, p. 218).

This idea might be readily accepted if it were not for the hut-pots of Bāmpur and Katukan, associated at the former site, in a stratigraphical position recorded by Stein as +3 ft. to 4 ft.,[2] with painted pottery of the type found in many of the Khurab burials. These hut-pots cannot well post-date their prototypes by more than one hundred and fifty years at the outside, so that a date of not later than 2300 B.C. must hold for them. It appears, therefore, that we must recognize the fact that there was a succession of burials at Khurab and that the single burial found in trench E with its predominantly unpainted ware and its shaft-hole axe must be late.

It must be admitted that the situation is complicated by the fact that an incised pot-stone vase, which, although not specifically of hut-pot style, is unlikely to be wholly unconnected with it, was brought to light in a grave in the adjoining trench F; a grave having so far as one can judge a similar style of pottery to that in trench E (Stein, 1937, figs. 40 and 41). Even this difficulty, however, cannot affect the still greater one of reconciling the hut-pots with a shaft-hole axe of *circa* 1900 B.C. or probably later.

The period that follows the extinction of the peasant farming communities of Baluchistan and of the Harappā civilization is a very blank one. We have the Jhūkar people who occupied three at least of the town-sites in Sind but not Mohenjo-daro itself. The accounts of the Aryan invasions in the *Ṛigveda* argue for two important things, compromises with the Harappans and dissensions among the invaders. At this point one's arguments, in default of exact information, are bound to become somewhat conjectural, but they are linked with ascertained facts and do not, one hopes, take off into those airy realms of fantasy where all material evidence is disregarded.

Possibly in part contemporary with the Jhūkar culture are two superimposed groups of burials having similar pottery but differing burial rites found at cemetery H, Harappā, which I call Rāvi I and II. The Rāvi peoples have left us no material evidence of their culture other than their characteristic painted pottery found in their graves and in the upper levels of the citadel mound at Harappā, nor have the makers of an incised grey ware named after the site of Jhāngar in Sind. A very distinctive style of triple jar of this ware, with tubular connexions joining all three, was found at Chanhu-daro; triple jars

[1] Childe (1952, p. 202) claims this as 'the earliest representation of that beast in the Middle East'; a sherd, however, from Sialk III 4 or 5 (Ghirshman, 1938, pl. LXXIX, A2) must represent a camel. True it has no hump, but neither has the one from Khurab.

[2] A table showing the stratification of objects at Bāmpur as recorded by Stein is given in Appendix I (below, p. 180).

of this type appear at Shāhī Tump in the late cemetery and at Sialk in the graves of Necropole B and also at Shāh Tepe, so although this ware is certainly post-Jhūkar, it is unlikely to be wholly outside the period affected by the invasions of the first half of the second millennium.

Reviewing the material available, the statement of Majumdar (1934, p. 70) that 'it seems reasonable to suppose that Jhāngar represents a culture which arose in the Manchhar region subsequent to that of the lake-dwellers of Trihni and Shah Hasan' is almost certainly correct. That both the painted pottery and the chert flakes showed a falling off in workmanship tallies with the general picture of a retrogression into barbarism. The painted pottery of Jhāngar is a bichrome ware which derives, in view of its proximity, from Trihni and may very well have influenced and been contemporary with the bichrome pottery of Phase II at Rangpur (Dikshit, 1950, pl. XIV). A tentative dating of about 1200-1100 B.C. for this not very important industry would square with the present indications available.

These invasions appear to have been the result of the movements of warlike peoples, exemplified by those of Giyan II and Hissar III. Such movements and in fact the general unrest at the start of the second millennium, which spread throughout all the countries south of the Caucasus from Anatolia to Elam, must be associated with the appearance of the Aryans upon the historical scene. There is evidence, such as the walled-up gateway, of Harappā being increasingly on the defensive (Wheeler, 1947, p. 74 and pl. XXVIII), and it is suggested that this resistance to invaders lasted from *circa* 1700 to 1650, when the city fell to the first Rāvi people. The hymns of the *Rigveda* indicate that some of the invaders came to terms with the Harappans, and it is likely that Mohenjo-daro had semi-peaceful contacts with the Jhūkar people before being wiped out about 1550 B.C. by an attacker whose only probable trace is the adze-axe found in the upper levels of that site and the evidence of a massacre of citizens.

The undoubted taking over by the Indo-Aryans of various elements of iconography and belief from the Harappans argues for such contacts and compromises. It seems likely also that those Aryan or semi-Aryan tribes of the Turvaśa, Vṛichivants and Yadus, who were located in the south-west and called Dāsa in one passage of the *Rigveda* (X. 62, 10) and who are referred to as having been brought by Indra from across the sea (*samudra* = Indus?), were descendants of the Jhūkar people. They fought the true Vedic clans of the Tṛitsu and Sṛiñjaya from the time of the battle at Hariyūpīyā, which may well indicate Harappā, to the decisive battle many years later when the confederacy of the Ten Kings, an alliance of all the western clans under the leadership of the Yadus and the Turvaśa, was beaten by the Tṛitsu and Sṛiñjaya under Sudās.

6. TRIHNI AND RANGPUR

What cultural elements are available from the exploration and digging on western sites to fill the gap of a thousand years from 1400 B.C. to the arrival of Alexander in India? A pottery known as Trihni ware having a bold floral decoration is found at Lāl Chatto mound near Trihni, at Shāh Hasan and Lohri round Lake Manchhar and at Chanhu-daro, all in central Sind. At Chanhu-daro one is defeated by the system of recording: I have, however, in Appendix II (below, p. 180), done my best to plot a reasonable version of the distribution of the majority of sherds found. The depth of between 4 and 7 ft. below surface at which this pottery was found in trench B3, even at the more conservative average height, allowing for slope and inequalities, of surface above datum of 2 instead of 4 ft., precludes it being written off as lying in a deposit of rain-wash débris.

To face page 170

PLATE LXXVI



A



B

Ceremonial axe-head of bronze from Khurab, Persian Makrān: A, side-view showing seated camel; B, end-view showing shaft hole (see page 169). Ht. 7¼ in.

At the Lāl Chatto mound of Trihni Majumdar dug a number of trenches; here he found Trihni ware in definite association with chert flakes in his two principal trenches and with a sherd also of typical Jhūkar pottery. Some items suggestive of the Harappā culture were found, and had deeper digging not been prevented by the high water-level, it is possible that an earlier Harappan occupation would have been established. A similar situation obtained Shāh Hasan, where again chert flakes were in definite association with Trihni ware. At Lohri two Trihni sherds were found, but they appear there in apparently a late Amri setting, which one may believe to be out of their proper context (Majumdar, 1934, pp. 61-7 and pls. XXIII and XXIV, 14 and 18).

It is possible to suggest wider associations for the Trihni ware. A sherd from Dabar Koṭ in the Zhob (Stein, 1929, pl. XV, D.E. ii. 6) shows a striking similarity and so to a lesser extent do sherds from Iskān Khān and Spīna Ghunḍai, Manazakari (Stein, 1929, pl. XXI, I.K. 1 and Sp. M. 2). The sherd from Spīna Ghunḍai has a pink and brown decoration on a cream slip and that from Dabar Koṭ appears to have the same, so both style and colour are suggestive of Trihni (fig. 9, 1 and 3-5).

The fact that at many sites occupations using painted pottery ended, in the case of Rānā Ghunḍai apparently in flames, and no further painted wares were found in succeeding levels or in the immediate neighbourhood suggests that they may have been roughly contemporary; it suggests also that the sherds found by Ross in his level E at Rānā Ghunḍai are to be associated with the period of Trihni. Though it is recognized that, relatively speaking, these painted wares are late, it is important to note that nothing which in any way resembles them belonging to the early historic period has been found in north-west Pakistan, sherds of the first century B.C. to the seventh century A.D. being readily distinguishable (Stein, 1929, pls. I-IV; Stein, 1937, pls. I and II; Gordon, 1945, pls. V-VII and XI-XIV).

Contemporary with Trihni, therefore, I include under the headings of Loralai V and Periāno IV a variety of painted wares characterized by slap-dash painting, sometimes in polychrome, on a wide range of pottery fabrics. These late wares have yet to be fully sorted out by regular excavation, but none of them appears to be allied to Londo ware which will be discussed later. Seeing that Loralai V was followed at Rānā Ghunḍai by the three levels of Loralai VIa, b and c, some of which are almost certainly represented at Ḍabar Koṭ, Spīna Ghunḍai and Periāno Ghunḍai, all with unpainted pottery, and that the bulk of the north-western pottery that is known of the fourth to second centuries B.C. is unpainted, and as Ross found a ground stone axe at the upper margin of his level E, it is proposed to place the period of Trihni, when chert flakes were still in use, as from *circa* 1400-1200 B.C. and to give roughly the same date to the Zhob periods of Loralai V and Periāno IV.

We must now try and place the pottery industries of Rangpur in northern Gujarat. For some time after the appearance of reports by Vats and Ghurye on Rangpur, this site was regarded by many as being an outpost of the Harappā culture, and it was not until Dr. Moreshwar Dikshit had conducted regular excavations in 1947 that it was proved to have no connexion. What, then, were the objects which made the earlier investigators think that there had been an extension of the Harappā culture at Rangpur? It seems that the presence of several triangular terracotta cakes and a fancied resemblance between the painted black-on-red wares of both areas were regarded as justifying a claim for identity of culture. The work of Dr. Dikshit has proved what many including the present writer had always held, that any connexion was definitely indirect and that this was no actual extension such as that of Ḍabar Koṭ in the Zhob (Dikshit, 1950).

The flat dishes, which are such a feature of the Rangpur ware, seem to be an echo of similar dishes appearing in both Harappā and Jhūkar levels on Indus valley sites

(see specially Wheeler, 1947, figs. 18 and 19). Sherd 5 on pl. XVII of Dikshit's report has a motif which compares with a Jhūkar one from Chanhu-daro and the animals are part of the Iranian tradition of pot-decoration, which is noticeable also in the pottery of Rāvi II. These points should be borne in mind should investigators try and persuade themselves that these industries, in particular Phases I and II, are very late in date. Dikshit's final statement that the Rangpur culture 'belongs to a post-Harappā phase, probably after the advent of the Aryans' appears to be substantially correct. As has been indicated above, a linking up of the bichrome wares of Rangpur II with those of Trihni and Jhāngar is by no means impossible, and a spread of a re-introduction of bichrome painting during the period 1250-1100 B.C. would be a fair assumption from the evidence available.

7. THE CAIRN-BURIAL PEOPLE AND LONDO WARE (fig. 2)

It is necessary first of all to establish that those who buried their dead in cairns and whose cemetery sites extend over a large area are the same as the makers of Londo ware, or, if not identical, that their activities covered much the same period. In Baluch Makrān and southern Baluchistan, the sites of Fīroz Khān Damb and Kambar-damb in Mashkai and the Spet Damb of Jhau all produce typical Londo ware and also sherds having the large volutes or pot-hook spirals found at Damba Koh, Jīwanrī and other cairn-burial sites and also at Kasāno Damb in the Nihing valley (fig. 9, 15-18). The pottery which was established by Miss de Cardi as Londo ware, found at thirtysix sites from Shamī Damb, Parom, to Kullo Kalāt, Chhappar, has zones of small volutes obviously derived from the larger ones (de Cardi, 1951). Volutes as a decoration on pottery are far from common in western Asia and in all areas are linked with Iron Age sites and in many with cairn-burials.

There are other points besides the use of iron and of volutes which serve to link these sites. These folk were horse-riders; horse-skulls were found in two of the cairns at Zangian and on Londo ware horses appear on sherds from Shamī Damb, Gushānak, Bīt Damb, Bāghwāna, Hadi and Londo itself (fig. 9, 9 and 11). The cairn-burials are also characterized by a form of squat spouted flask which is found at most sites from Fanuch in Persian Makrān to Moghul Ghundai in the Zhob. It is not contended that the people who observed the rite of cairn-burial and the users of Londo ware were necessarily identical, though at some sites such as the Spet Damb of Jhau, Shāhdīnzai in Mashkai and Neghār, Taghazī Damb and Zayak in Khārān this would appear probable; be this as it may, they were certainly contemporary.

The possibility of this whole complex of cairn-burials, Londo ware, horse-riding and the use of iron being connected, even at long range, with that of Sialk VI has been challenged by Leslie Alcock (1952, pp. 93-5), who does not seem to have followed up the various clues very closely. The facts are as follows. Stein recorded an unbroken chain of cairn-burial sites from Chāh Darat, more than 50 miles north of Kirmān, to Kalāt in central Baluchistan. He found no such cairns in Fars or along the coast towards Bushire (Stein, 1937). The indication, which can only be established by future reconnaissance, is that they came either from the north from the direction of Birjand or from the north-west from the direction of Sialk and Giyan. Evidence of a similar culture having pottery with volutes and iron sickles of Sialk VI type comes from Chiga-kabud; at Bāgh-i-Limu a sherd was found with a volute, and sherds with birds from Girairan are somewhat similar in style to Londo painting; all these are in the general area of Giyan, and though an actual


56
60
64
68
72
34
30
HERAT
KABUL
SHALOZAN
GHAZNI
FARAH
BIRJAND
CHAH DARAT
SAR-I-ASIAB
KIRMAN
CHIL GABRA
NAD-I-ALI
QILA-I-BIST
DASHT -I- POGDAR
KANDAHAR
MOGHAL GHUNDAI
PERIANO GHUNDAI
R. RAVI
HARAPPA
RANA GHUNDAI
QUETTA
DABAR KOT
KULLO KALAT
MULA PASS
R. INDUS
NEGAR
TAGHAZI D.
LONDO
ZAYAK
SHARI
JHUKAR
MOHENJO-DARO
LOHUMJO-DARO
SUNERI
SHANDINZAI
BELAR
GWARJAK
FEROZ KHAN D.
TRIHNI
CHANHU-DARO
KAMBAR D.
KULLI
SPET D.
GUSHANAK
JHANGAR
BALOR
NASARABAD
SHAHI
KASANO DAMB
RUGHAM
TUMP
ZANGIAN
DAMBA KOH
GATTI
BASOT
JIWANRI
SHAMI D.
TUMP-I-GABARAH
HAZAR
DAMEL
MARDT
DAMIN
MURTAN
SURKH-I-QALAT
DAMBAN
FANUCH
CAIRN BURIAL SITES
LONDO SITES
SCALE OF MILES
50 0 50 100 150

Fig. 9

connexion with the particular culture of Sialk VI may be difficult to sustain, an early one with the Iranian plateau is self-evident[1] (fig. 9, 7, 8, 12-14).

As regards the cairns of Moghul Ghundai, it must be admitted that the relief-decorated pot found by Stein presents a considerable difficulty, such a pot being of a very late style. The bezel ring, which has never been illustrated except in useless profile, could quite easily fall within the dates of 650-450 B.C., which I propose as covering the majority of the cairns at this site. Three-flanged arrow-heads are present at Sialk (Ghirshman, 1939, pl. XCII, 17 and 18) and also at Nad-i-Ali in both periods at that site; they have a very long life indeed and no dating value. The adjustable silver bangle, however, has parallels only of some considerable antiquity, including a late period example from Giyan (Herzfeld, 1941, fig. 264).

It would be simpler perhaps to be able to di[illegible] the cairn-burials of the Zhob from the rest, but the identity of the main bulk of [illegible] prevents this. The same factor, however, also prevents these cairn-burials [illegible] associated with any of the early historic sites in the North-West Frontier Pro[illegible] [illegible]njab. It may appear as dodging a difficulty, but as there is not one singl[illegible] other than this one pot with relief decoration, that has been recovered from [illegible] [illegible] or a Londo site throughout Baluchistan or Persian Makrān which sugge[illegible] [illegible] reasonable alternative, a Hellenistic, Parthian or Kushan origin, one can only [illegible] that some of the graves at Moghul Ghundai are those of people who lived there [illegible] times and whose presence is indicated at a number of the more important adj[illegible]

The same arguments hold good for Londo wa[illegible] [illegible]een produced for Trihni, namely that there is no resemblance to any of the pa[illegible] [illegible] of the early historic period found in north-west Pakistan. The development an[illegible] this cairn-burial people in Iran has yet to be traced, but a date of about 850 B.C. [illegible] [illegible]er their entry into Baluch Makrān. Londo ware is a contemporary but [illegible] [illegible]ation of this horse-riding people, showing niggling copies of the or[illegible] [illegible]tes and characterized by being tempered with 'grog' or fine[illegible] [illegible] cairns of Moghul Ghundai, representing this movement in its very [illegible] stages [illegible] from *circa* 650-450 B.C. but include later graves. There are in fact so many [illegible] [illegible]ves throughout the general and considerable area covered by cairn-burials, that [illegible] probably be found that they cover a long period of time. After all, present-day [illegible] graves are in their essentials cairn-burials.

8. THE MERGING OF THE PROTOHISTORI[illegible] [illegible]TH THE EARLY HISTORIC

It cannot be claimed that this review has so fa[illegible] [illegible]posed of all the forms of pottery that have been brought to light in the area under [illegible] [illegible]ssion or that the interpretation that has been made can hope to stand unchallenged. In particular there are two wares from sites in the Zhob which are of great importance but about which we have no information whatsoever that would indicate their proper place in the sequence. One is a grey ware with designs in black having ragged edges, which cover most of the surface in a solid blocked-in pattern (fig. 10, 1-10). This style of pottery is found at Rānā Ghundai, Sūr Jangal and Twin Mounds in the Loralai area and at Periāno Ghundai and Krānai. It is definitely allied to the Quetta shallow grey ware bowls in colour, form and decoration.

[1] The sherds and sickles from Chiga-kabud are given on pl. XV, Stein, 1940. The sherds from Bāgh-i-Limu and Girairan, now in the British Museum, have not previously been published and are now shown with those from Chiga-kabud in fig. 9.

The other, also mainly a grey ware though sometimes found in creamy buff, seems to be confined to small flat plates. The patterns, dark grey or black, are of well-executed and sophisticated leaf forms, linked by a wavy tendril pattern (fig. 10, 10-16). They give an impression of being of late date, but incised cross-hatchings which are found on the underside of the first-mentioned shallow grey bowls or plates appear similarly placed on these plates also, so that a connexion between the two cannot be ruled out. These have come to light at Rānā Ghunḍai, Twin Mounds, Ḍabar Koṭ and Periāno Ghunḍai; so it should be possible to determine by excavation the exact position of both these grey wares and their relationship one with another, should it exist.

In addition, painted pottery has been recovered from Periāno Ghunḍai which shows little resemblance to any f... ...ny other site; this refers in particular to a form of handled jar, the remains o... w... fairly common in the upper levels of the mound (fig. 9, 19 a-c). Generally ... ...se jars give the impression of belonging to the early historic period. Ḍabar K... ...hunḍai and Periāno Ghunḍai all have remains of the early historic peri... ...levels, and it remains to be seen whether a sequence can be obtained fr... ...upation of Loralai I down to Loralai VI C, broken only by inc...

Great, ...es are being built on Painted Grey Ware, discovered mainly at a la... ...e eastern borders of Panjab and in the upper Gangā-Yamunā Doal... ...en found at Rupar stratified above the Harappā occupation at ... p. 3), but I am of opinion that some very definite evidence of ... coming before a direct continuity from one to the other can b... ...of vessels in Painted Grey Ware so far published are of a type ... ...ne earliest phases of the early historic period, shallow almost flat-bo... ...tly incurved sides (Panigrahi, 1946, fig. 12).

The dating ... ...olished Ware, which follows the Painted Grey Ware, and of the Och... ...it are factors in this problem; the evidence of Rājghāṭ (m... ...ry B.C. ... ...inuing much later), Ahichchhatrā (third century B.C.), Śi... ...ntury A.D.), Sar Ḍherī (middle second century B.C.), Maheśwar (secon... ...to first century A.D.) and Bhīr Mound, Taxila, (middle fourth centur... ...tury B.C.) does not admit of the N.B.P. Ware being dated back earlier th... ...he very earliest.[1] A central date for this ware is not the fourth century ... ...nd century B.C.[2] This is not the occasion to argue the dates of Bhīr Mo... ...certainly occupied until the end of the second century B.C. if not somewhat ... ...), and Sirkap is unlikely to have been occupied before 150 B.C. It is not v... ...erefore that N.B.P. Ware should appear with rouletted ware at Śiśupālgarh ... ...79). It seems unlikely that Painted Grey Ware can carry us back earlier ... B.C. and this I regard as optimistic. Ochre-washed Ware may well prove to be ... ...d with the copper hoards of the Gangetic valley (Lal, 1951, p. 38) and is associa... ...aheśwar with that kind of painted pottery which in southern India and the Decca... ...to have been prevalent during, in the most provisional of figures, the period 800-300 B.C. (Sankalia, 1953, fig. 1). The gap is, however, narrowing,

[1] Rājghāṭ, observation by F. R. Allchin and present writer at site and the Museum of the Bhārat Kalā Bhavan, Banaras; Ahichchhatrā, Ghosh and Panigrahi, 1946; Śiśupalgarh, Lal, 1949; Sar Dherī, unpublished excavation report of Mukerjee and Gorbiau and observation by the present writer; Maheśwar, Sankalia, 1953; Taxila, observation by the present writer at site and Museum and evidence of the terracotta figurines. At Rājgir (Ghosh, 1950) Period II has been dated by the presence of the N.B.P. Ware.

[[2] See, however, above pp. 22-23 and 31.—Ed.]

but the material still needs the confirmation of some accurate stratigraphical sequences on selected sites before we can make any further headway.

9. CONCLUSION

Having reviewed comprehensively the ceramic industries of the Indo-Iranian borderlands, a mention of the theory of Red and Buff Ware areas put forward by Donald McCown and Stuart Piggott would not be out of place. Briefly the idea is that Red Ware dominates the area south-east of the Caspian including Hissar, Sialk and Chashmah Ali with an extension to the Zhob area of Baluchistan and the Indus valley and Buff Ware dominates the whole of Mesopotamia and south-eastern Iran from Tepe Gawra to Tal-i-Bakun with extensions to Sīstān, Persian Makrān and ...tral and southern Baluchistan (McCown, 1946, fig. 1, and Piggott, 1946, fig. 1). Th... ...y has the attraction of simplicity, but this would appear to be its sole merit. ...en speaks of the Buff Ware culture as if it were an indivisible whole, regar... ...rations of environmental unity which cut clean across his areas.

In the southern or Buff Ware area of the regio... ...dealing the position is as follows. Among the early industries—Ch... ...Hazar Mardi and Nūrābād in the Rudbar and deriving elements from... ...ent red ware; Togau ware, widely distributed, has 100 per cent r... ...urab has at least 50 per cent red ware; Quetta is difficult to judge ... ...iple zoning may be Sadaat ware but has many red sherds; and, ... Londo has 100 per cent red ware. In the northern of Red War... ...ly industries, Loralai II has 80 per cent buff ware and in Loralai ... ...pots of Amri bichrome type of pale-buff pottery. Few of the ... ...alai V and Periāno IV are red ware; they are mostly grey, pink, pinkish ... ...ny buff.

A reference to 'The Potter's Technique at Tell ... by J. L. Kelso and J. P. Thorley,[1] in which, on page 90, they mention th... ...nature of iron in red clay, gives, I think, the correct answer to many of our p... ...ations. Here they list no less than seventeen accurate colour-values observed ... Mirsim, showing all gradations between Buff, Brown, Orange, Red and Gre... ...planations they give would account for the very wide range recorded at many ... from this, however, it is clear that the wares of Chāh Husaini and Togau a... ...d intentionally red and that of Loralai II intentionally buff.

Turning now from the question of pot fabrics to t... ...; in his note 'The "Dark Age" in north west India' published in *Antiquity* (1... ...93-5) Alcock first of all wishes, for no stated reason, to push the date of the close of ... Indus civilization back up to 2000 B.C. and then upbraids Miss de Cardi, Stuart Pigg... and myself for introducing Londo ware and the allied cairn-burials as products of pe...le who lived somewhere in the period 1500-500 B.C. What he fails to realize is that the hundreds of sherds collected in Baluchistan, Sind, the North-West Frontier Province and Panjab cover the whole period from the start of the use of pottery to the present day. Though not impossible, it is very improbable that anything entirely new will be brought to light.

[1] This description of pot fabrics and methods of decoration and of the technique of manufacture should be regarded as being the standard guide governing the nomenclature used by archaeologists in dealing with pottery. Messrs. Kelso and Thorley have done for Late Bronze and Early Iron Age pottery what Miss Richter and Dr. Schumann have done for the Classical Greek wares; and in both instances their results, achieved by practical experiment, admit of no doubt or argument.

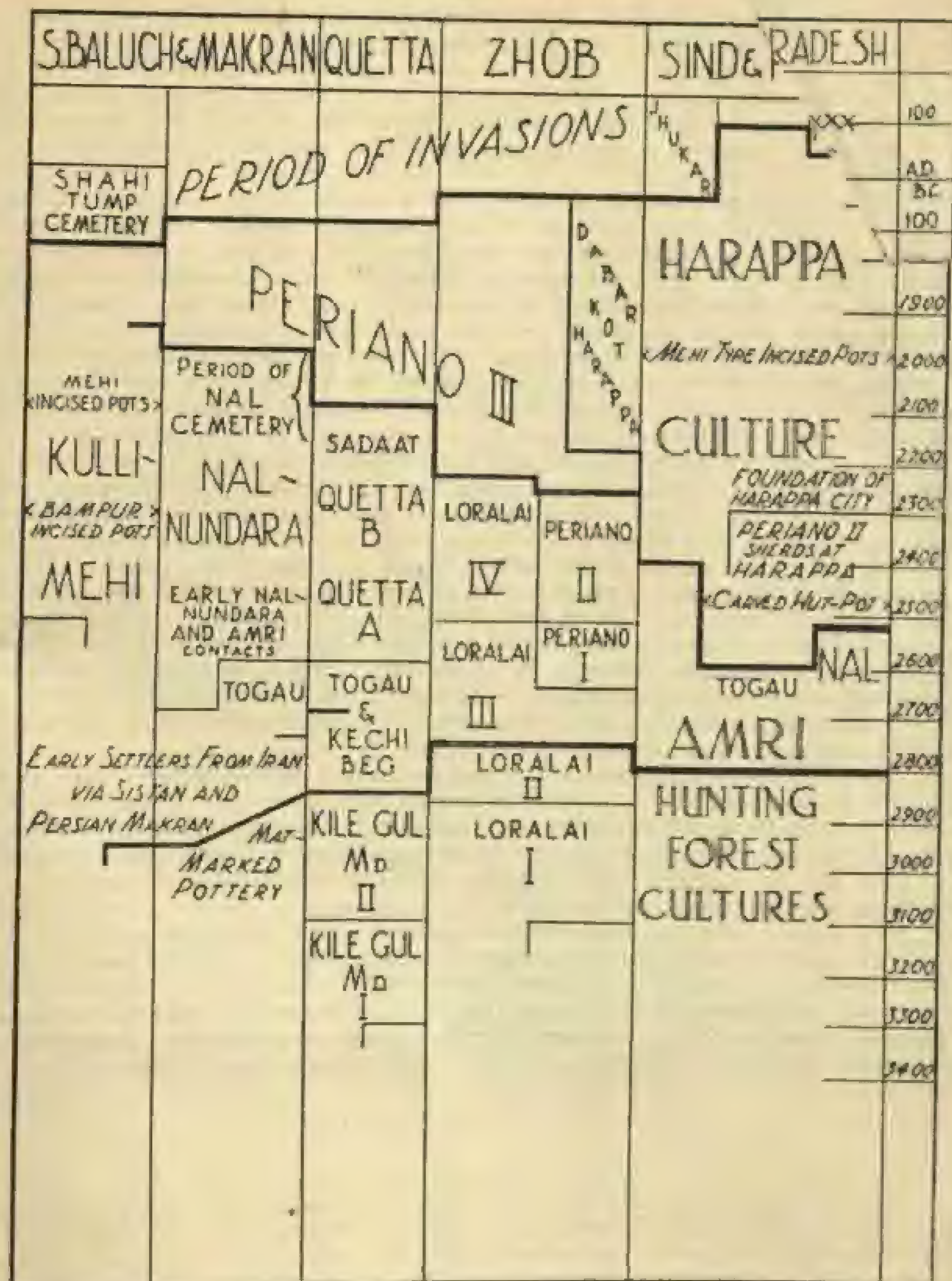

S.BALUCH & MAKRAN
QUETTA
ZHOB
SIND & PRADESH
PERIOD OF INVASIONS
JHUKAR
SHAHI TUMP CEMETERY
PERIANO III
DABAR KOT HARAPPA
HARAPPA CULTURE
MEHI INCISED POTS
PERIOD OF NAL CEMETERY
MEHI TYPE INCISED POTS
SADAAT
KULLI-MEHI
BAMPUR INCISED POTS
NAL-NUNDARA
QUETTA B
QUETTA A
FOUNDATION OF HARAPPA CITY
PERIANO II SHERDS AT HARAPPA
CARVED HUT-POT
LORALAI IV
PERIANO II
PERIANO I
EARLY NAL-NUNDARA AND AMRI CONTACTS
LORALAI III
NAL
TOGAU
TOGAU & KECHI BEG
TOGAU
AMRI
EARLY SETTLERS FROM IRAN VIA SISTAN AND PERSIAN MAKRAN
LORALAI II
MAT-MARKED POTTERY
KILE GUL MD II
LORALAI I
HUNTING FOREST CULTURES
KILE GUL MD I
100
AD
BC
100
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
3400

Fig. 3

says that nothing of the Harappā civilization is later than 2000 B.C.
...s of Trihni, Loralai V, Rangpur and Londo are all early historic and
...c., we are left with a cultural vacuum. Too much ground has been
... be possible that such a vacuum should exist as the result of inadequate
no one has suggested that the whole of West Pakistan, the eastern Panjab
were deserted during this period. Nature may abhor a vacuum but it can
...ally it cannot.

...k rightly calls for 'further and intensive attacks on the problem of the Indian
...'. These can only be carried out to advantage in the form of further controlled
...on to allow us to place in exact sequence all the material we now have at our disposal. We shall not discover, I am sure, anything very new or startling, but comparative stratigraphy may show us, if we are fortunate enough to get the evidence of pots exported from one area to another, just what wares were contemporary with which. Among other important sites, that of Dabar Koṭ stands out as one which would reward careful excavation.

We may not yet have the correct answers, but the pioneer work of Professor Stuart Piggott has done so much to map out the right lines on which we should proceed that one cannot now go far wrong. Differences must in the main be those of detail; with the possibility, though not probability, of very few exceptions he has settled once and for all the main sequence and general inter-relationship of all the principal cultures with which we have been dealing. The chronological charts (figs. 3 and 4) which accompany this paper emphasize by thick lining certain events which can be deduced from the evidence of the ceramic industries and other cultural objects and the known comparative stratigraphy; these are the spread of wheel-thrown pottery of Kechi Beg-Amri type, the spread of the Harappā culture and that of Periāno III and the line drawn by the Period of Invasions. Thanks mainly to the work of Ross and Piggott we know that this sequence of events and the ceramic industries to be associated with them is firmly established. The period of the Harappā civilization from first to last, from the unplumbed depths of Mohenjo-daro to its extinction, must be covered by a dating of *circa* 2600-1550 B.C., and this is the keystone of our chronological structure.

Any solution of the problem of cultural succession must not offend reason, at least not to the point of absurdity. Gaps in the cultural occupation of sites there will of course be, but not contemporary gaps over vast habitable regions; a study of any historically attested period will assure us of this fact. A complete blank in southern Baluchistan from the time of the Shāhī Tump cemetery to the advent of the cairn-burial people, say from *circa* 1650 to 850 B.C. seems unreasonable and some material should be available to fill part at least of this void, presumably further research will in due course produce it.

No finality is claimed for the attempt at a chronology made here, but it has been reasoned out step by step, working on what are regarded by me with some degree of confidence as approximately fixed chronological points. This presentation of a relatively detailed chronology should give those interested something more substantial to get their teeth into, and if they cannot swallow it they can at least have the satisfaction of worrying it.

10. ACKNOWLEDGEMENTS

Permission, which is gratefully acknowledged, has been given by the Peabody Museum of Archaeology and Ethnology of Harvard University to publish the photographs, generously supplied by the Curator, of the Khurab axe; also by the Department of Archaeology of the Government of India and Miss de Cardi to publish line-copies of objects in their publications and the Trustees of the British Museum to publish line-copies of objects in the Stein and Martin collections.

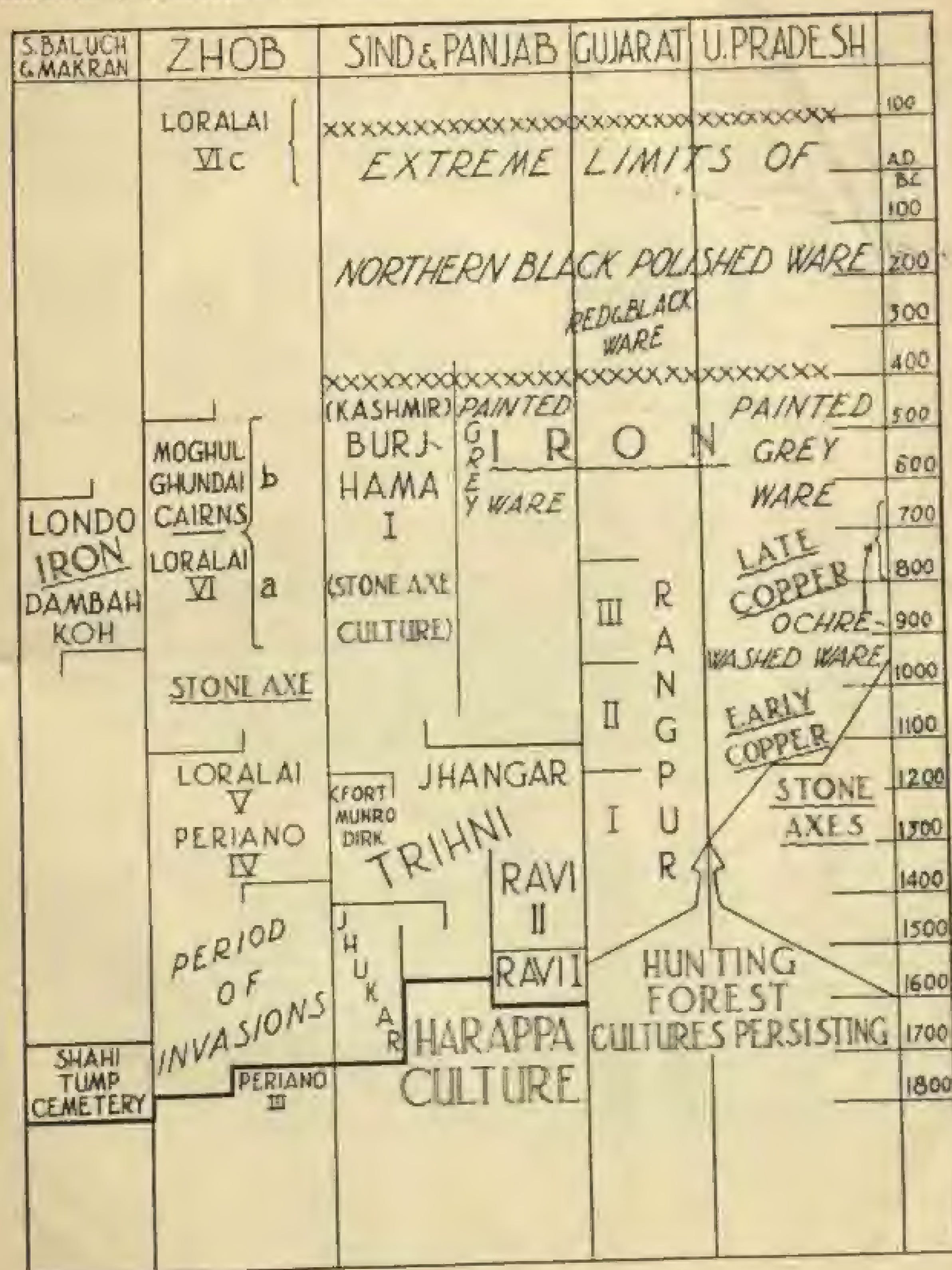

S. BALUCH & MAKRAN
ZHOB
SIND & PANJAB
GUJARAT
U. PRADESH
100
AD
BC
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
LORALAI VI c
EXTREME LIMITS OF
NORTHERN BLACK POLISHED WARE
RED & BLACK WARE
(KASHMIR) BURJ-HAMA I
PAINTED GREY WARE
IRON
PAINTED GREY WARE
MOGHUL GHUNDAI CAIRNS
b
LORALAI VI
a
LONDO IRON DAMBAH KOH
(STONE AXE CULTURE)
LATE COPPER
OCHRE-WASHED WARE
III
II
I
RANGPUR
STONE AXE
EARLY COPPER
LORALAI V
PERIANO IV
FORT MUNRO DIRK
JHANGAR
STONE AXES
TRIHNI
RAVI II
RAVI I
PERIOD OF INVASIONS
JHUKAR
HUNTING FOREST CULTURES PERSISTING
HARAPPA CULTURE
SHAHI TUMP CEMETERY
PERIANO III

Fig. 4

APPENDIX I

Sir Aurel Stein records in his book *Archaeological Reconnaissances in North West India and South-East Iran* the excavation of a test trench that he made at the settlement site of Bāmpur. The height of the locality he chose above the surrounding plain was 12 ft. and he trenched it down to plain level. He does not say whether the trench at this level reached natural soil, but one infers, perhaps incorrectly, that it did. The following is Stein's sequence shown in relation to feet above plain level which was his method of recording :—

12	Glazed sherds and querns	Intrusive Muslim graves.
11	Coarse jars of small size	
10	Plain pottery with white slip	
9, 8	Sherds with painted designs, chiefly hatchures, wavy lines and lozenges in black or red on red or pink.	
7, 6	Fine thin grey ware and plenty of red pottery with designs in black.	
5, 4, 3	As for above, but incised dark grey hut-pots appear in this level, also pear-shaped flint arrow-heads.	
2, 1	As for above, but also plain red burnished ware.	

A certain number of sherds in the British Museum from Bāmpur are marked with their position above plain level in accordance with this system. The lowest marked (+2 ft.) is a red sherd with a series of horizontally disposed wavy lines, not undulating but rising to points, in black. The grey incised hut-pot sherds are all +3 ft. except one which is +4 ft. The few marked sherds of typical Bāmpur-Khurab painted ware are +4 ft. The highest up object traceable is a narrow jar in pink ware at +6 ft. of a common, widely distributed type similar to those illustrated in Mackay, 1937, II, pl. LXV, T. 18, and 1943, pl. XXVI, 70, from Mohenjo-daro and Chanhu-daro respectively, and also Majumdar, 1934, pl. XXXVI, 29, from Kohtrās.

Burnished red ware sherds such as were found in the lowest level were also collected by Stein at Tump-i-Sauloyeh, Fanuch and Tump-i-Bijnabad, all in Persian Makrān.

APPENDIX II

What the real position of the Trihni sherds at Chanhu-daro may have been is, on the information produced by Mackay, a matter of guess-work. Plotting the sherds in accordance with the indications given in Mackay's section taken on the line 11/D to 4/D (Mackay, 1943, pl. V) those in Trench B3 would range from 6 ft. to 9 ft. B.S. and those in Trench B1, dug at plain level 4 ft. below the fixed datum, would include three sherds, one at 3·5 ft. and two at 3·8 ft. suspended in mid-air. There is little likelihood that either of these can be correct, but there is no indication of inequalities in the surface of any particular trench. If one were to suppose that the average height above datum of the surface of the soil where the sherds were found in Trench B3 was 2 ft. and not 4 ft. and that it stood at datum on an average at Trench B2 and was 2½ ft. below datum at Trench B1, then the greater number of sherds of Trihni ware would lie between upper limits of 3 to 4 ft. B.S. and lower ones of 7 to 4½ ft. B.S. This suggested picture of the probable facts is embodied in the accompanying schematic section (fig. 5) which shows the position below datum and likely position below surface of all the recorded Trihni sherds at Chanhu-daro.

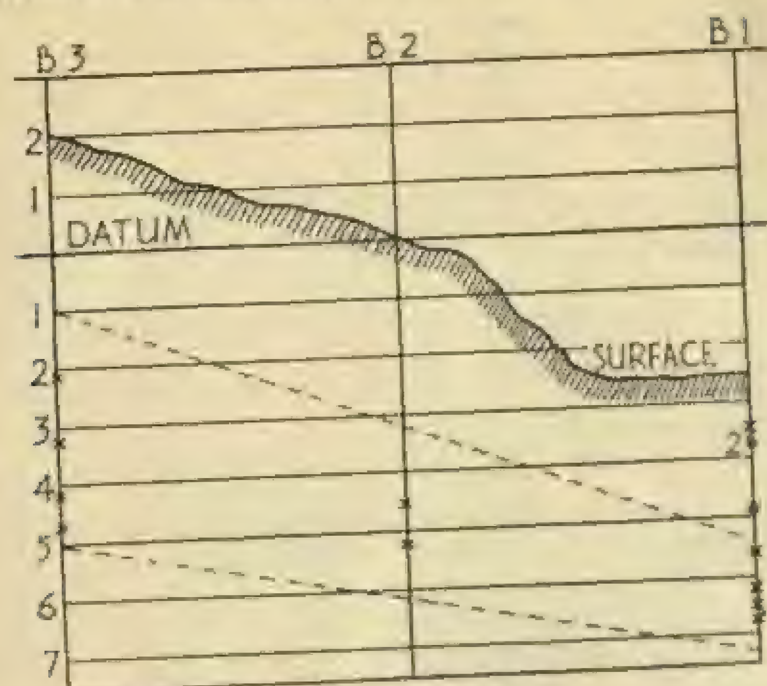


Fig. 5

REFERENCES

1. Alcock, L., 1952, 'The Dark Age in north-west India', *Antiquity*, June.
2. Andrews, F. H., 1925, 'Neolithic pottery in Sistan', *Burlington Magazine.*
3. de Cardi, B., 1950, 'On the borders of Pakistan', *Art and Letters*, XXIV.
4. Do., 1951, 'A new prehistoric ware from Baluchistan', *Iraq*, XIII, pt. 2.
5. Childe, V. G., 1952, *New Light on the Most Ancient East* (London).
6. Deva, K., and McCown, D. E., 1949, 'Further exploration in Sind: 1938', *Ancient India*, no. 5.
7. Dikshit, M. G., 1950, *Excavations at Rangpur 1947*, Bulletin of the Deccan College Research Inst., XI.
8. Fairservis, W. A., 1952, 'Preliminary report on the prehistoric archaeology of the Afghan-Baluchi areas', *American Museum of Nat. Hist. Novitates*, no. 1587.
9. Ghirshman, R., 1938-39, *Fouilles de Sialk* (Paris).
10. Ghosh, A., 1951, 'Rajgir 1950', *Ancient India*, no. 7.
11. Do., 1953, Presidential Address, Archaeological Section, All-India Oriental Conference.
12. Ghosh, A., and Panigrahi, K. C., 1946, 'The pottery of Ahichchhatrā', *Ancient India*, no. 1.
13. Gordon, D. H., 1945, 'Early Indian painted pottery', *Jour. Ind. Soc. Oriental Art*, XIII.
14. Do., 1947, 'Sialk, Giyan, Hissar and the Indo-Iranian connection', *Man in India*, 27, no. 3.
15. Gordon, D. H. and M. E., 1940, 'Mohenjo-daro, some observations on Indian prehistory', *Iraq*, VII, pt. 1.
16. Hargreaves, H., 1925, *Excavations in Baluchistan*, Mem. Arch. Sur. Ind., no. 35.
17. Herzfeld, E. E., 1941, *Iran in the Ancient East* (London and New York).
18. Kelso, J. L., and Thorley, J. P., 1943, 'The potter's technique at Tel Beit Mirsim', *The Annual of the American Schools of Oriental Research*, XXI-XXII (in one).
19. Lal, B. B., 1949, 'Sišupālgarh 1948', *Ancient India*, no. 5.
20. Do., 1951, 'Further Copper Hoards from the Gangetic basin', *Ancient India*, no. 7.

21. Mackay, E., 1938, *Further Excavations at Mohenjo-daro* (Delhi).
22. Do., 1943, *Chanhu-daro Excavations* (Connecticut).
23. Majumdar, N. G., 1934, *Explorations in Sind*, Mem. Arch. Surv. Ind., no. 48.
24. Marshall, J., 1931, *Mohenjo-daro and the Indus Civilization* (London).
25. McCown, D. E., 1946, Preface to 'A chalcolithic site in northern Baluchistan', *Jour. Near Eastern Studies*, V, no. 4.
26. Piggott, S., 1943, 'Dating the Hissar Sequence—the Indian evidence', *Antiquity*, December.
27. Do., 1946, 'The chronology of prehistoric north-west India', *Ancient India*, no. 1.
28. Do., 1947, 'A new prehistoric ceramic from Baluchistan', *Ancient India*, no. 3.
29. Do., 1950, *Prehistoric India*, (Harmondsworth).
30. Ross, E. J., 1947, 'A chalcolithic site in northern Baluchistan', *Jour. Near Eastern Studies*, V, no. 4.
31. Sankalia, H. D., 1953, 'Excavations in the Narmada valley', *Jour. M. S. University of Baroda*, II, no. 2.
32. Stein, A., 1928, *Innermost Asia* (London).
33. Do., 1929, *An Archaeological Tour in Waziristan and Baluchistan*, Mem. Arch. Surv. Ind., no. 37.
34. Do., 1931, *An Archaeological Tour in Gedrosia*, Mem. Arch. Surv. Ind., no. 43.
35. Do., 1937, *Archaeological Reconnaissances in north-west India and south-east Iran* (London).
36. Do., 1940, *Old routes in western Iran* (London).
37. Vats, M. S., 1940, *Excavations at Harappā* (Delhi).
38. Wheeler, R. E. M., 1947, 'Harappā 1946', *Ancient India*, no. 3.
39. Do., 1953, *The Indus Civilization* (Cambridge).

FIG. 6

1. Kulli (Stein, 1931, pl. XXI, Kul. I. v. 1).
2. Nāl (Hargreaves, 1925, pls. XVI, 24 and XIX, 13, R.F. 1).
3. Nāl (Hargreaves, 1925), pl. XXI, 15.
4. Pāndi Wāhī (Deva and McCown, 1949, pl. VII, 74).
5, 6 and 7. Nāl, (Hargreaves, 1925, pl. XXI, 1, 2 and 3).
8. Tikri Damb (Stein, 1931, pl. XXIV, Tik N. 5).
9. Pāndi Wāhi, black on red (Majumdar, 1934, pl. XXIX, 37).
10 and 11. Nazarābād (Stein, 1931, pl. X, Naz 19 and 2).
12, 13 and 16. Gate Dap (Stein, 1931, pl. XX, G.D. 4, 8 and 1).
14. Pāndi Wāhī, black on natural ground (Majumdar, 1934, pl. XXVIII, 1).
15. Kohtrās, black on red (Majumdar, 1934, pl. XXIX, 31).
17. Othmanjo Buṭhi, chocolate on buff (Majumdar, 1934, pl. XXIX, 10).
18. Lohri, chocolate on cream (Majumdar, 1934, pl. XXIV, 29).



Fig. 6

FIG. 7

1-3. Togau, black on red (de Cardi, 1950, pl. 1, 5).
4. Awaran, black on red (Stein, 1931, pl. XXIV, Aw 2).
5. Zard Gudar, black on red (de Cardi, unpublished).
6. Kargushkī Damb, black on red (Stein, 1931, pl. II, Kar b. I).
7. Periāno Ghuṇḍai, black on red.
8. Periāno Ghuṇḍai, black on pale brown.
9. Rānā Ghuṇḍai, reconstructed, black on red. Ht. 13·5 cm.
10. Periāno Ghuṇḍai, black on polished red slip. Ht. 7·3 cm.
11. Periāno Ghuṇḍai, dark brown on pink.
12 and 13. Periāno Ghuṇḍai, black and red on cream. The colouring of these reconstructed bowls is identical with Jhūkar pottery and may be of the same date. Diam. of both 32·5 cm.

(When there is no reference in this and the subsequent figures, sherds were in the author's collection, now mainly in the Institute of Archaeology, London, and the Museum of the University of Edinburgh.)